



सत्यमेव जयते

Government of India  
Ministry of Skill Development and Entrepreneurship  
Directorate General of Training  
Regional Directorate of Skill Development and Entrepreneurship



भारत सरकार  
कौशल विकास और उद्यमिता मंत्रालय  
प्रशिक्षण महानिदेशालय  
कौशल विकास और उद्यमिता का क्षेत्रीय निदेशालय

இந்திய அரசு  
திறன் மேம்பாட்டு மற்றும் முனைவோர் அமைச்சகம்  
திறன் மேம்பாட்டு மற்றும் தொழில்முனைவு பிராந்திய இயக்குநரகம்

## NATIONAL SKILL TRAINING INSTITUTE GUINDY, CHENNAI - 600032



# TRAINING BROCHURE 2024 - 2025

No.10, Alandur Road, CTI Campus, Guindy, Chennai - 600032

Phone: 044 - 2250 1211

Website : <https://nstichennai.dgt.gov.in/>

Email: [nsti-chennai@dgt.gov.in](mailto:nsti-chennai@dgt.gov.in) / [rdsde-tn-msde@gov.in](mailto:rdsde-tn-msde@gov.in) / [stcnstichennai@gmail.com](mailto:stcnstichennai@gmail.com)

Contact: P. Namasivayam, Deputy Director @ 9444632551 for further enquiries.

The **DIRECTORATE GENERAL OF TRAINING** is the apex organization for development and co-ordination at National level programmes relating to vocational training including Women's Vocational Training and Employment Services. Industrial Training Institutes are under the administrative and financial control of State Governments or Union Territory Administrations. DGT also operates Vocational Training Schemes in some of the specialised areas through field institutes under its direct control. Development of these programmes at national level, particularly in the area concerning common policies, common standards and procedures, Training of Instructors and Trade Testing is the responsibility of the DGT.

**NATIONAL SKILL TRAINING INSTITUTE**, Chennai was established in 1968 under the aegis of Directorate General Training (DGT), Ministry of Skill Development and Entrepreneurship , Government of India, New Delhi with the assistance from United Nations Development Programme (UNDP) / International Labour Organisation (ILO) to impart training and updating the skills of Engineers / Supervisors / Technicians / Executives of Industrial personnel & faculties of educational institutions through courses of short duration conducted in modules and Tailor made courses as per the specific needs of their Industries / Govt Estt. / PSUs / Technical Institutions. The courses are conducted for higher skill upgradation through intensive skill oriented training by using the latest version of equipment and machinery used in industry.



## **VISION**

NSTI Chennai provides innovative, effective and integrated training opportunities for people who need new skills to enjoy the dignity that comes with employment, independence and self reliance.

## **MISSION**

To continuously hone the skills of industrial workforce for higher productivity bridging the gap between academics and industries for suitable placement for young generation in technical fields.

## ADVANCED VOCATIONAL TRAINING SCHEME(AVTS) - SHORT TERM COURSES

1. Short - term course of 24 Weeks duration in engineering areas are envisaged / being implemented in the NSTIs.
2. Special Course duration can be extended up to 12 weeks also.
3. Courses on Skill upgradation / enhancement can also be arranged in basic engineering orientation and foundation in core engineering disciplines in viz, fitting carpentry, plumbing, electrical and electronics sector.
4. The said programme will benefit Engineering / ITI / Polytechnic students and also serving industrial personnel in order to get acquaintance of basic engineering skill and practice.

## ELIGIBILITY CRITERIA

### FOR REGULAR COURSES

Degree in Engineering/Diploma/NAC/NTC  
Qualification can be relaxable for Industrially Sponsored Candidates having Industrial Experience.  
ITI Final year students .

### FOR TAILOR MADE COURSES

Qualification can be relaxed in deserving cases.  
Fully at the discretion of the Regional Director.

## FEE STRUCTURE

### FOR REGULAR COURSES (Period up to 12 Weeks)

Candidates sponsored from medium and large - scale Industries in	Rs. 2000/ - per Trainee per week
Candidates sponsored from Small Industries and Private candidates	Rs. 1000/ - per Trainee per week
Candidates nominated by Government Departments like Railways, Defence etc.	Rs. 1250/ - per Trainee per week
Candidates sponsored from Educational Institute like Polytechnic /Engg. College & other related Technical Institutions etc.	Rs. 1000/ - per Trainee per week

### FOR TAILOR MADE COURSES/ SPECIAL ADVANCED LEVEL COURSES

Candidates sponsored from medium and large - scale Industries in both Public and Private sector.	Rs. 4000/ - per Trainee per week
Candidates nominated by Government Departments like Railways, Defence etc.	Rs. 2500/ - per Trainee per week
Candidates sponsored from Educational Institute like Polytechnic /Engg. College & other related Technical Institutions etc.	Rs. 2000/ - per Trainee per week

## OTHER FEES

1. Application Cum Registration fees	Rs. 100/ - per Trainee per Course
2. Hostel Rent fees	Rs. 100/ - per day per participant in case Hostel Accommodation is Required
3. Gymkhana Fees	Rs. 10/ - per Course for Regular Courses Rs. 15/ - per Course for the Tailor - made courses
Payment of fees (Excluding Gymkhana Fees) should be made by the way of crossed <b>DD in favour of "PAO, MSDE - CHENNAI"</b> payable at CHENNAI. <b>Gymkhana Fees should be paid in Cash only.</b>	

## NOTE

- ◆ The Regional Director/Principal reserves the right to cancel or postpone a scheduled programme course without assigning any reason.
- ◆ In the event of any closed or declared holiday, the programme/course will commence on the next working day and conclude on the last working day of the schedule.

## ADVANCED WELDING

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
MIG/MAG Welding Techniques and its Applications	240101	2 Weeks	03-06-24 to 14-06-24	17-09-24 to 27-09-24	02-12-24 to 13-12-24	

**Course Contents:** Augmented Reality Welding Simulator, awareness of welding & safety, Edge preparation, weld symbols, weld measurement, Introduction to Gas metal Arc Welding (GMAW) ,Welding Terms and Definitions, Electrical terms power source & equipment, Various shielding gases and its characteristics on GMAW, Cylinders colour code & Identifications, GMAW welding electrodes – codes , Torches, Maintenance & trouble shooting, Wire Feed unit ,Modes of metal transfer, Synergic & pulsed MIG Welding, FCA Welding process ,Defects causes and remedy

TIG Welding Techniques and its Applications	240102	2 Weeks		01-07-24 to 12-07-24	14-10-24 to 25-10-24	27-01-25 to 07-02-25
---	--------	---------	--	----------------------	----------------------	----------------------

**Course Contents:** Augmented Reality Welding Simulator, awareness of Welding & Safety , Terms & definition of welding , Electrical terms & AC, DC Polarity control system , Introduction to GTAW equipment and power source , Types of tungsten electrodes and their uses, Filler rod specification, Grinding of electrode tip, Types of Inert gases and their character in shielding Properties of ferrous & non- ferrous metals , Principle of HF unit & DC suppressor, torches and maintenance , Concept of pulsed TIG Welding , Defects, causes and remedy

Aluminium Welding using TIG Techniques	240103	2 Weeks		22-07-24 to 02-08-24	04-11-24 to 14-11-24	17-03-25 to 28-03-25
--	--------	---------	--	----------------------	----------------------	----------------------

**Course Contents:** Augmented Reality Welding Simulator, basic Electrical Terms & Arc Voltage concepts, Power source of GTAW welding, AC, DC Suppressor& HFU, Types of tungsten electrodes and its tip preparation, Characteristic of inert gas, Properties of Aluminium, Filler wire specification, Introduction of TIG Welding on Aluminium, Current setting, Arc Voltage parameter, Defects causes and remedy

Stainless Steel Welding using TIG and MIG	240104	2 Weeks	18-06-24 to 28-06-24	19-08-24 to 30-08-24	18-11-24 to 29-11-24	
---	--------	---------	----------------------	----------------------	----------------------	--

**Course Contents:** Augmented Reality Welding Simulator, Safety, Basic Electrical Terms & Arc voltage concepts, Power source of GTAW welding & HFU, Types of tungsten electrodes and its tip preparations, Characteristic of Inert gas, Types of SS and its metallurgy for welding, Challenges in fabrication, Introduction of MIG welding on S, Current setting, Arc voltage – parameter, Defects, causes and remedy

## AUTOMOTIVE TECHNOLOGY

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Diagnosis, Repair and Maintenance of MPFI Petrol Engine	240201	2 Weeks		09-09-24 to 20-09-24	25-11-24 to 06-12-24	03-03-25 to 14-03-25

**Course Contents:** Principle and working of four stroke engine, engine components, and variable valve timing technology (VVT)- Function, components and working of lubrication system & cooling system, fuel feed system and its types, Ignition system and its types MPFI system in petrol engine, emission control emission norm turbo charged engine, maintenance of engine, Engine diagnostic methods and Troubleshooting- Check the compression pressure, vacuum pressure & oil pressure on the engine- Dismantling, cleaning, inspecting and reassembling the petrol engine, Check the ignition timing on MPFI petrol engine, testing of Ignition system, set the valve timing, checking and adjusting valve tappet clearance, overhauling of lubrication, cooling and fuel feed systems, onboard diagnosis using scan tool, checking of sensors and actuators, checking of exhaust gas using exhaust gas analyzer-

Diagnosis, Repair and Maintenance of CRDI Diesel Engine	240202	2 Weeks	22-04-24 to 03-05-24	08-07-24 to 19-07-24	09-12-24 to 20-12-24	10-02-25 to 21-02-25
---	--------	---------	----------------------	----------------------	----------------------	----------------------

**Course Contents:** Principle and working four stroke engine, engine components, valve operating mechanism, function, components and working of lubrication, cooling and fuel system and its types ,CRDI system in diesel engine, emission control, Euro & BS emission norms, turbo charged engine, maintenance of engine, Engine diagnostic methods and Troubleshooting, check the compression pressure on the engine dismantling, cleaning, inspecting and re assembling the diesel engine, cylinder head overhauling, set the injection timing on diesel engine, set the valve timing, checking and adjusting valve tappet clearance, overhauling of cooling, lubrication and fuel systems, onboard diagnosis using scan tool, checking of sensors and actuators in CRDI, checking of exhaust gas using exhaust gas analyzer-

Diagnosis and Repair in Automobile Electrical and Autotronics	240203	2 Weeks	06-05-24 to 17-05-24	05-08-24 to 16-08-24	04-11-24 to 14-11-24 30-12-24 to 10-01-25	
---	--------	---------	----------------------	----------------------	--	--

**Course Contents:** Basic principles and function of auto electrical system- Battery and its maintenance, working of ignition system, charging, starting, lighting system and accessories in modern vehicles -wiper motor, power window, multiplex wiring, remote central locking system, immobilizer system, parking assist system, vehicle safety system & navigation system- Reading of electrical wiring diagram of a vehicle, working principle of instruments and gauges, warning symbols, Troubleshooting on Electrical system-checking and charging of battery, overhauling and testing of starter motor and alternator, checking of lighting system and accessories- Basic electronic components principle, working and their applications in automobiles, checking of diodes, transistors, capacitors, different relays and solenoid used in vehicles, working principles and testing of different sensors and actuators, ECM and onboard diagnostic system, use of scan tool, Read and erase of DTC

## AUTOMOTIVE TECHNOLOGY

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Maintenance of Light Motor Vehicle -(Petrol and Diesel ) and Car AC	240204	2 Weeks	27-05-24 to 07-06-24	26-08-24 to 06-09-24	14-10-24 to 25-10-24	20-01-25 to 31-01-25

**Course Contents:** Specification of light motor vehicles, principle and working of four stroke engine, engine systems and its maintenance, valve mechanism, valve clearance and its importance- layout and function of transmission and its components and their maintenance, components of brake system,suspension system, steering system and their maintenance, tyre specification, tyre inflation and its maintenance importance of wheel alignment and wheel balancing, construction of battery and its maintenance, car air conditioning system principles- working and maintenance, emission control, maintenance of chassis and suspension system , checking of air inflation pressure and tyre rotation, checking of engine oil level, coolant level, brake oil and power steering oil and top up, testing and charging of battery, replacing of fuel filter, air filter and oil filter, cleaning of vehicle, 5s method, identification of engine fault using scan tool, checking of car air conditioning system and its components, inspection and replacing of spark plug, adjustment of clutch, brake and steering free play, vehicle lubrication, Engine tune up, inspecting of sensors and actuators using scan tool, checking of exhaust gas using exhaust gas analyzer, emission norm, maintenance schedule of light motor vehicle, fuel saving methods

## MACHINE TOOL MAINTENANCE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
5's Management and Total Productive Maintenance	240301	1 Week				10-02-25 to 14-02-25

**Course Contents:** Industrial Safety, Introduction to Machine Tool Maintenance and types of maintenance, Autonomous Maintenance, Pillars of Total Productive Maintenance, Major Losses associated with production, Condition Monitoring Methods, Total Productive Maintenance – Policies and Goals,5 'S' Work Place Management, 7 QC Tools-

Painting Techniques, Defects and Remedies	240302	1 Week		05-08-24 to 09-08-24	18-11-24 to 22-11-24	17-02-25 to 21-02-25
---	--------	--------	--	----------------------	----------------------	----------------------

**Course Contents:** Painting tools & Equipment's, Types of putty & application, Types of emery, application& grade, Surface preparation of Metals & wood, varnishing of wooden surfaces, Curing processes in AC room and oven, Constituents of Paints, Application of paints, Car Finishing- Cement surface defects & wall painting defects & remedies, Lettering & Stenciling

Condition Monitoring and Failure Analysis of Bearings	240303	1 Week				20-01-25 to 24-01-25
---	--------	--------	--	--	--	----------------------

**Course Contents:** Industrial Safety, Introduction to Machine Tool Maintenance and types of maintenance, Bearing – types, specification, application and inspection, Bearing selection, bearing failures, causes and remedy- Lubricant types, characteristics, oil selection and lubrication methods, Condition monitoring of bearings, Failure Analysis

## METROLOGY AND ENGINEERING INSPECTION

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Metrology, Engineering Inspection and Quality Control	240401	2 Weeks	06-05-24 to 17-05-24	08-07-24 to 19-07-24	04-11-24 to 14-11-24	03-03-25 to 14-03-25

**Course Contents:** Terminology used in metrology, Demonstration of Metrological Instruments, Slip Gauges, Measure the angle of taper using Sine bar, Calibration Methods and its importance, Calibration of Height gauge, Vernier caliper, Micrometer and Dial Gauges, Surface Table Types & its Importance, Linear Measurement Practice using 2D Height Master, Surface roughness measurement, Measure/inspect straightness, flatness and roundness using Co-ordinate Measuring Machine (Mechanical), Demonstration of Profile Projector- Quality control and SQC techniques

Calibration of Dimensional Measuring Instruments and Gauges	240402	1 Week	27-05-24 to 31-05-24	01-07-24 to 05-07-24 26-08-24 to 30-08-24	14-10-24 to 18-10-24 02-12-24 to 06-12-24	06-01-25 to 10-01-25 10-02-25 to 14-02-25
---	--------	--------	----------------------	--	--	--

**Course Contents:** Terminology used in metrology, Calibration procedure for vernier calipers (IS-36651), External Micro meter (IS-2967), Vernier height gauges (IS-2921), Plunger type dial gauges (IS-2092), Lever type dial gauge (IS-11498), Calibration of MICROMETER (Internal & External), Vernier caliper, Vernier Height gauge, Gear tooth vernier caliper and Dial test Indicator, checking flatness of reflective surfaces by using Monochromatic light and optical flat,

## METROLOGY AND ENGINEERING INSPECTION

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Basic Practices in Dimensional Measuring Instruments	240403	1 Week	15-04-24 to 19-04-24 03-06-24 to 07-06-24	22-07-24 to 26-07-24 02-09-24 to 06-09-24	21-10-24 to 25-10-24 09-12-24 to 13-12-24	20-01-25 to 24-01-25 17-02-25 to 21-02-25

**Course Contents:** Terminology used in metrology, Practical on Basic Dimensional measuring instruments, Exercise on Outside micro meter, Vernier caliper, exercise on height measurements, Demonstration on Height master, Demonstration on angular measurements, Demonstration on measurements in Sine bar, exercise, Demonstration on angular measurements by bevel protractor, Measure/inspect straightness, flatness and roundness using Co-ordinate Measuring Machine (Mechanical), Demonstration of Profile Projector

Geometrical Measurements	240404	1 Week	22-04-24 to 26-04-24 10-06-24 to 14-06-24	05-08-24 to 09-08-24 09-09-24 to 13-09-24	18-11-24 to 22-11-24 16-12-24 to 20-12-24	27-01-25 to 31-01-25 17-03-25 to 21-03-25
--------------------------	--------	--------	--	--	--	--

**Course Contents:** Terminology used in metrology, checking of straightness of Straight surface by using Spirit level and checking by Dial gauges, V-Block and checking flatness of reflective surfaces by using Monochromatic light and optical flat, Measure/inspect straightness, flatness and roundness using Co-ordinate Measuring Machine (Mechanical), Demonstration of Profile Projector ,GD & T Features

Metrology and Engineering Inspection	240405	1 Week	29-04-24 to 03-05-24 24-06-24 to 28-06-24	19-08-24 to 23-08-24 23-09-24 to 27-09-24	25-11-24 to 29-11-24 30-12-24 to 03-01-25	03-02-25 to 07-02-25 24-03-25 to 28-03-25
--------------------------------------	--------	--------	--	--	--	--

**Course Contents:** Course Contents: Terminology used in metrology, Demonstration of Metrological Instruments, Slip Gauges, Measure the angle of taper using Sine bar, Calibration Methods and its importance, Calibration of Height gauge, Vernier caliper, Micrometer and Dial Gauges, Linear Measurement Practice using 2D Height Master, Surface roughness measurement, Measure/inspect straightness, flatness and roundness using Co-ordinate Measuring Machine (Mechanical), Demonstration of Profile Projector-

## uPVC CARPENTRY LAB

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
uPVC Window Fabrication	240501	2 Weeks	13-05-24 to 24-05-24	01-07-24 to 12-07-24	14-10-24 to 25-10-24 02-12-24 to 13-12-24	

**Course Contents:** Basics of uPVC Windows & Doors, Types of uPVC Windows & Doors, Structure of uPVC Windows & Doors, Parts of uPVC Windows & Doors, Advantages of uPVC Windows & Doors, Identification of Profiles, Hardware & Accessories, Machinery, Tools, Reinforcement, Glass, Gaskets- Profile Cutting- Cutting Profile as per drawing, Checking Cut Of profile, Perform Length Check, Marking on profile- Reinforcement Cutting & Fixing- Drainage Hole Cutting- Routing Holes- Performing Welding on welding machine- Corner Cleaning- Assembly Of Handles · Fixing Of Gaskets · Fixing Of Hinges · Assembly of rollers · Select the correct glass for the window · Glass fixing as per drawing · Bead Cutting & Fixing · Perform Cleaning · Perform quality check -

## PNEUMATIC AND HYDRAULIC CONTROLS

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Pneumatic and Electro Pneumatic Controls	240601	2 Weeks	27-05-24 to 07-06-24	01-07-24 to 12-07-24 23-09-24 to 04-10-24	16-12-24 to 27-12-24	13-01-25 to 24-01-25

**Course Contents:** Construction of single, double acting cylinder circuits – Direct & Indirect method, Pneumatic and Electro Pneumatic circuit construction with the use of DCV,OR, AND, Memory, Time Delay, Pressure sequence, Quick exhaust, flow control and Limit switches, Construction of circuits for Pneumatic and Electro pneumatic system in Fluid Sim Simulation software, Construction of regenerative circuit, Pneumatic system (care & Maintenance), Hands-on practice on construction of Pneumatic & Electro-pneumatic control circuit for industrial applications-

Hydraulic and Electro Hydraulic Controls	240602	2 Weeks	15-04-24 to 26-04-24	15-07-24 to 26-07-24	14-10-24 to 25-10-24 11-11-24 to 22-11-24	30-12-24 to 10-01-25
--	--------	---------	----------------------	----------------------	--	----------------------

**Course Contents:** Construction of single, double acting cylinder circuits – Direct & Indirect method, Hydraulic and Electro Hydraulic systems construction with the use of DCV, Time Delay, Pressure sequence, flow control and Limit switches, Proximity sensors. Construction circuits for Hydraulic and Electro Hydraulic systems in Fluid Simulation software, Construction of regenerative circuit, Hydraulic and Electro Hydraulic systems (care & Maintenance), Hands-on practice on construction of Hydraulic and Electro Hydraulic systems for industrial applications--

# PNEUMATIC AND HYDRAULIC CONTROLS

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Electro-Pneumatic Automation With PLC	240603	1 Week	29-04-24 to 03-05-24 13-05-24 to 17-05-24	29-07-24 to 02-08-24	04-11-24 to 08-11-24	17-02-25 to 21-02-25

**Course Contents:** Identification of components by their schematic symbols, Electro pneumatic 3/2,5/2 solenoid valves, Sensor Technology, limit switch & applications, Electrical Timers, Relay contactors, Latching Circuits, Circuit's construction with the use of Relays, Contactors, Electrical Timers, sensors, limits switches Introduction to PLC & PLC Programming, Ladder diagram, Programming, executing, running and verifying output of simple programs, Modifying an existing program and executing and verifying its output-

Advance Pneumatic Controls	240604	1 Week	06-05-24 to 10-05-24	05-08-24 to 09-08-24		24-02-25 to 28-02-25
----------------------------	--------	--------	----------------------	----------------------	--	----------------------

**Course Contents:** Pneumatic and Electro Pneumatic construction with the use of OR, AND, Memory, Time Delay, Pressure sequence, Quick exhaust, flow control and Limit switches- Cascading of Multi cylinders, Sequential control of multi-Cylinders, Designing, assembling and checking of pneumatic circuits-

Digital Transformation of Fluidic Power	240605	1 Week		19-08-24 to 23-08-24	25-11-24 to 29-11-24	17-03-25 to 21-03-25
---	--------	--------	--	----------------------	----------------------	----------------------

**Course Contents:** Setup and commissioning of an electro pneumatic circuit, Configuration of mini control systems, Setup of a communication network, Setting of an OPC server, Setting of push notifications, Selecting the circuit diagram and understand the program, Commissioning the circuit, Building up the communication network, Determining and setting the process parameters, Operating, adjusting, and performing maintenance work on the system, Getting to know the web service of the controller-

Basic Mechatronics System	240606	2 Weeks	10-06-24 to 21-06-24	02-09-24 to 13-09-24		27-01-25 to 07-02-25
---------------------------	--------	---------	----------------------	----------------------	--	----------------------

**Course Contents:** Construction of single, double acting cylinder circuits – Direct & Indirect method- Pneumatic and Electro Pneumatic construction with the use of OR, AND, Memory, Time Delay, Pressure control, Quick exhaust, flow control and Limit switches- Circuit using Simulation software -circuits for Pneumatic and Electro pneumatic system to detect various objects- Programming, executing, running and verifying output of simple programs-

Mechatronics for Industrial Automation	240607	1 Week	24-06-24 to 28-06-24		09-12-24 to 13-12-24	10-02-25 to 14-02-25
--	--------	--------	----------------------	--	----------------------	----------------------

**Course Contents:** Construction of Pneumatic and Electro Pneumatic circuits- Circuits for Pneumatic and Electro pneumatic system to detect various objects Programming, executing, running and verifying output of simple programs- Demonstration and operation of Mechatronics application

# ELECTRONIC CONTROLS AND MAINTENANCE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Programming of PLC for Digital and Analog I/O Applications using Siemens S7-1200 and S7-400 PICs- (TIA PORTAL)	240701	1 Week		01-07-24 to 05-07-24	14-10-24 to 18-10-24	24-02-25 to 28-02-25

**Course Contents:** Working principle of Programmable Logic Controller, Classification of Sensors and Actuators, Configuring a PLC with their Input/Output modules and establish communication, Procedure adopted to connect, communicate, download and execute programs. Programming of PLC for simple applications using Ladder logic, Practice on Programming for various Industrial applications using Discrete IOs and Analog IOs and interfacing with Sensors and Actuators.

Siemens PLC - S7 400/1200 - SCADA and HMI Programming and Applications- (TIA Portal)- (Includes Conveyor and Lift Control Applications)	240702	2 Weeks	08-04-24 to 19-04-24	01-07-24 to 12-07-24	14-10-24 to 25-10-24	24-02-25 to 07-03-25
---	--------	---------	----------------------	----------------------	----------------------	----------------------

**Course Contents:** Working principle of Programmable Logic Controller, Procedure adopted to connect, communicate, download and execute programs. Practice on Programming for various Industrial applications using Discrete IOs and Analog IOs and interfacing with Sensors and Actuators. Practice on creation of Tag Database and GUI Screen Template, Programming of PLC for simple applications with SCADA & HMI, Programming for Industrial applications (Lift & Conveyor applications) and Analog functions.

## ELECTRONIC CONTROLS AND MAINTENANCE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Introduction to Fiber Optics Communication, FTTH Cable splicing techniques and Installation	240703	1 Week		22-07-24 to 26-07-24	04-11-24 to 08-11-24	

**Course Contents:** : Introduction to Fiber Optic Communication system and applications. Functional description of various sections of Fiber Optic Communication network. Identify various sections of OFC trainer. Prepare, crimp, terminate and test various cables and connectors, use crimping tools, splicing tools and test various cables used in Fiber to home network, check various types of Splitters, connector terminations and perform Insertion Loss testing of Optical splitters in network. Perform fiber preparation for splicing and apply fusion, perform OTDR test, measure the signal strength & losses and assess cable performance using Optical Power meter, Prepare FIBER OPTIC NETWORK setup and execute transmission and reception..

Python Programming for Embedded Applications	240704	1 Week	06-05-24 to 10-05-24	29-07-24 to 02-08-24		27-01-25 to 31-01-25
--	--------	--------	----------------------	----------------------	--	----------------------

**Course Contents:** :Introduction to Python programming, data types, strings, list, control flow, functions, examples. Python Programming for simple IoT applications.

Embedded System Programming using Python for Industrial Applications and IoT using Raspberry Pi - 2040 (dual core)	240705	1 Week	13-05-24 to 17-05-24	05-08-24 to 09-08-24	18-11-24 to 22-11-24	03-02-25 to 07-02-25
--	--------	--------	----------------------	----------------------	----------------------	----------------------

**Course Contents:** Introduction to Embedded Controllers & Applications. Specification & Architecture of Dual-core Arm Cortex-M0+ processor. Features - on-chip SRAM, UART, SPI controllers, I2C controllers, USB, PWM channels etc. Classification of Registers & I/O ports and Modes of addressing. Programming for simple operations using Embedded C/Python. Peripheral devices and interfacing, Programming of I/O devices using Switches, Sensors, LEDs, Relays, 7-seg display, LCD, Stepper motor, DC motor, servo motor, Bluetooth, Serial communication – UART, I2C etc, Networking of IoT devices, IoT - Cloud applications – Smart Agriculture, Smart City, etc

Industrial Automation with AC/DC Drives and PLCs - (Siemens)	240706	1 Week		19-08-24 to 23-08-24	02-12-24 to 06-12-24	10-02-25 to 14-02-25
--	--------	--------	--	----------------------	----------------------	----------------------

**Course Contents:** : Overview of Industrial Automation and the Role of PLCs & Drives. Methods of Speed Control of AC / DC motors, Servo motors, BLDC motors etc. Power Control concepts, PWM techniques, PID controller & Drive parameters. Working principle of Drives, Four quadrant Drive & methods of Braking. Demonstrations and testing using DMM, DSO etc. Practice on Power control of drives with Converters & Inverters. Practice on Configuring parameters of VFD. Configuring PLC for Interfacing with Digital and Analog modules and programming. Programming of PLC for simple applications using Ladder logic. Practice on Programming of PLCs for motor control. Control of AC Drive using PLC.

PCB Designing, Simulation and testing of Electronic Circuits	240707	1 Week	10-06-24 to 14-06-24	02-09-24 to 06-09-24	16-12-24 to 20-12-24	
--	--------	--------	----------------------	----------------------	----------------------	--

**Course Contents:** : Classification of PCBs, Identification of different PCBs, Soldering & desoldering of Electronic circuits, SMD components, Simulation & testing of Electronic circuits, Electronic circuit design using Proteus or Auto desk Software. Designing, Assembling and testing of a PCB.

Drone Aerodynamics, Assembling and Testing of Drones	240708	2 Weeks	18-06-24 to 28-06-24	17-09-24 to 27-09-24	23-12-24 to 03-01-25	10-03-25 to 21-03-25
--	--------	---------	----------------------	----------------------	----------------------	----------------------

**Course Contents:** Introduction to Drone technology, Communication concepts, different types of drones & their applications, Sensors & transducers used in drones, GPS and applications. Block description of Drone system & Safety precautions, Perform disassembly and reassembly of common drone system, Motors – Servo motors & BLDC motors. Specifications & Configuration of Drone System Hardware & Software, Controllers used in Drone, Procedure employed to test the controllers & peripherals. Identify and resolve common error messages and corrections by Software debugging. Inspect, test and trouble-shoot (execute primary and secondary servicing) with symptoms noticed

## CNC CENTRE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
CNC Turning, Operation and Programming with SINUMERIK 802D SL	240801	1 Week	24-06-24 to 28-06-24		25-11-24 to 29-11-24	10-02-25 to 14-02-25

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Program of Turning Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-



# CNC CENTRE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
CNC Turn Mill, Operation and Programming with SINUMERIK 802D SL	240802	2 Weeks	24-06-24 to 05-07-24		25-11-24 to 06-12-24	

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Program of Turning Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations for Turning & Milling in Turn mill Centers, Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-

CNC Turning, Operation and Programming with FANUC Oi - TF	240803	1 Week	15-04-24 to 19-04-24	08-07-24 to 12-07-24 30-09-24 to 04-10-24	09-12-24 to 13-12-24	17-02-25 to 21-02-25
---	--------	--------	----------------------	--	----------------------	----------------------

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Program of Turning Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-

CNC Turn Mill, Operation and Programming With FANUC Oi - TF	240804	2 Weeks	15-04-24 to 26-04-24	08-07-24 to 19-07-24	09-12-24 to 20-12-24	
---	--------	---------	----------------------	----------------------	----------------------	--

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Program of Turning Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations for Turning & Milling in Turn mill Centers, Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-

CNC Milling, Operation and Programming with SINUMERIK 828D / 840D	240805	1 Week	29-04-24 to 03-05-24	22-07-24 to 26-07-24	14-10-24 to 18-10-24 30-12-24 to 03-01-25	24-02-25 to 28-02-25
---	--------	--------	----------------------	----------------------	--	----------------------

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Programming for Milling Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-

Advanced CNC Milling Operation and Programming for 4th and 5th Axis Rotary and Swiveltable with SINUMERIK 828D / 840D	240806	2 Weeks	06-05-24 to 17-05-24	29-07-24 to 09-08-24	21-10-24 to 01-11-24	20-01-25 to 31-01-25 03-03-25 to 14-03-25
---	--------	---------	----------------------	----------------------	----------------------	--

**Course Contents:** Principles of CNC System & Elements of CNC Machines for 4th & 5th Axis with Rotary & Swivel Tables, Different Co-Ordinate Systems work Offset, Tool Offset Part Programming for Milling Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Advanced Machine Operations Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components using Advanced Milling Operations with Rotation, Mirroring, Scaling Options, making use of Rotary Tables & Swivel Tables as 4th & 5th Axis for Machining Complex Geometry & Basic Maintenance-

CNC Milling, Operation and Programming with FANUC Oi - MC	240807	1 Week	27-05-24 to 31-05-24	19-08-24 to 23-08-24	04-11-24 to 08-11-24	06-01-25 to 10-01-25 17-03-25 to 21-03-25
---	--------	--------	----------------------	----------------------	----------------------	--

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Programming for Milling Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-

(Mastercam) Milling	240808	1 Week	03-06-24 to 07-06-24		18-11-24 to 22-11-24	24-03-25 to 28-03-25
---------------------	--------	--------	----------------------	--	----------------------	----------------------

**Course Contents:** Introduction to Master cam 2019, Draw Commands, Modify Commands, 2D & 3D Part Modeling Exercises, Cam Commands, 2D Machining Techniques & 3D Machining Techniques, Post Processing for the Machine Controls, Sample Machining on the Machine-

CNC Turning, Operation and Programming With FAGOR 8055i	240809	1 Week	10-06-24 to 14-06-24	26-08-24 to 30-08-24		
---	--------	--------	----------------------	----------------------	--	--

**Course Contents:** Comparison between Conventional & CNC Machines, Principles of CNC System & Elements of CNC machines Preparatory & Miscellaneous codes, Different Co-Ordinate Systems work Offset, Tool Offset Part Program of Turning Practice on Simulation System, Selection of Tools, Speed, Feed & Depth of Cut, Subroutine Programming, Machine Cycles editing & Proving the part Program Basic Machine Operations Loading of Components, Editing of Part Programs, Proving selected Programs & Machining of Components & Basic Maintenance-

## CNC CENTRE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Basic Maintenance of CNC Machines	240810	1 Week		02-09-24 to 06-09-24		03-02-25 to 07-02-25

**Course Contents:** Elements of CNC Machines, Industrial Safety & 5's, Identification of Machine Elements, Total Machine Cleaning, Centralized Lubrication System & Hydraulics & Pneumatics- Servicing of Centralized Lubrication System, Checking the Lubrication Oil at the End User, Introduction to Electrical Drives & Encoders Feedback Control Systems their possible Failure & Alarm Systems- Causes of Breakdown & Troubleshooting, Servicing of Hydraulic System Elements-

## PROCESS CONTROL INSTRUMENTATION

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Programming and Applications of Industrial Automation Using Siemens PLC	240901	2 Weeks	27-05-24 to 07-06-24	23-09-24 to 04-10-24		27-01-25 to 07-02-25

**Course Contents:** Understanding of Programmable Controller Systems using TIA PORTAL- Identifying Common PLC Hardware, Components of Processors, I/O Systems- I/O Configurations, Creating a New Project with Ladder Logic, The Management of Screens and Controls, Alarm Management & Trending, OPC / DDE process communication with other PLCs- Entering, Editing, and Verifying Ladder Logic- Bird's eye view of TIA software, Building application based Project- Bottle filling and batch process station, working procedures and operational maintenance of MMS, IoT applications of Automation using MMS as per industry 4-0-

IoT with Sensors and Controllers	240902	2 Weeks	15-04-24 to 26-04-24		14-10-24 to 25-10-24	30-12-24 to 10-01-25
----------------------------------	--------	---------	----------------------	--	----------------------	----------------------

**Course Contents:** Introduction to microprocessor and micro controller, Microprocessor Vs Microcontroller, Introduction to Arduino Uno, raspberry pi ,Siemens 2050 gateways and related Software- Pin details of Arduino and Raspberry Pi , its Specifications- Basic configurations of Arduino and raspberry Pi with PC- Wi fi, Bluetooth and Ethernet shield interfacing with Arduino- Basic programs on Arduinouno, Raspberry pi and Siemens gateways for LED controlling and Push buttons, introduction to Arduino Uno ,Ethernet shield, WiFi (wireless) ,shield, Breadboard ,Jumper cables (male-male, male-female),Light sensor, Motion sensor (HC-SR501),Proximity sensor (Ultrasonic Range meter HC-SR04),Temperature sensor (TMP36),GPS module (NEO6MV2),Soil moisture sensor and Build your own project-

Testing and Calibration of Industrial Instruments	240903	1 Week		29-07-24 to 02-08-24	04-11-24 to 08-11-24	24-03-25 to 28-03-25
---	--------	--------	--	----------------------	----------------------	----------------------

**Course Contents:** : Instrument Diagrams (P&ID's),Introduction to Measurement System, Commonly used process control signals, Signal quality terminology (accuracy, linearity, span, etc-),System standards and instrument calibration-, Pressure Instruments – Principle, construction and operation, Calibration of low and high Pressure Bourden's Gauges ,Principle and operation of Strain gauge Pressure Sensors, Pressure Measurement & Control (Electronic and Pneumatic),Operation and calibration of Differential Pressure Switch & Safety Valve, Operation and calibration of I/P Converter, Temperature Instruments-Principle, Sensors for temperature measurement, Installation and Commissioning of RTD & Thermocouple, RTD – 2 Wire, 3 Wire and 4 wire Configuration, Thermocouple – Cold junction compensation and compensation cables, Calibration of Temperature Indicators (RTD & Thermocouple)-

Networking and Communications with HMI / SCADA	240904	1 Week	06-05-24 to 10-05-24	05-08-24 to 09-08-24		24-02-25 to 28-02-25
--	--------	--------	----------------------	----------------------	--	----------------------

**Course Contents:** Explaining HMI, SCADA, and PLCs, What They Do, and How They Work Together When it comes to the process automation PLCs, SCADA, and HMIs play crucial roles , Setup Ethernet network and configure TCP/IP ,Ethernet troubleshooting utilities and Protocol Analysis , Setup and monitor Mod bus TCP communication to bus coupler , Setup Keep ware OPC Data Access Server and use OPC client to access data, Use Graphical OPC Client to create a SCADA display of plant data, Alarm Management Exercise , Configure Alarms on Win CC SCADA System, HMI screen design using Win CC SCADA package, Accessing SCADA Historian data using Excel, Troubleshooting Exercise-

Networking , Build your own Firewall (DIY)	240905	1 Week		19-08-24 to 23-08-24 02-09-24 to 06-09-24		17-03-25 to 21-03-25
--	--------	--------	--	--	--	----------------------

**Course Contents: Network configuration :** IP addressing, Gateway, DNS, DHCP,RFC 1918private IPs Configuration of Router, WIFI Router TCP/UDP Ports . Firewall : overview Open Source Firewalls and tools Download the pf sense 4GB Nano BSD images with VGA Verification of MD5 hash Prepare a 4 GB USB drive as firewall with the downloaded pf sense image Set WAN and LAN addresses, DHCP configuration on firewall console Enable SSH access, Web GUI access to firewall from client PC Set Host and domain, Create Certificate Authority (CA).FIREWALL rule Access client PC web server from WAN side PC's browser Create PPTP VPN server, Set PPTP IP Pool Range, PPTP VPN user creation Backup and restore with changing of admin user name and password. Port forwarding across ports on self-built firewall. CLOUD: Overview of Cloud Technology (VM Ware, Virtual Box, Open VZ)DNS forwarding Traffic Monitoring ,Load Balancing, Fail over/ Fail safe configuration.

## CAD CENTRE

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Application of Autocad 2D and 3D Drafting in Engineering Design	241001	2 Weeks	15-04-24 to 26-04-24 29-04-24 to 10-05-24 27-05-24 to 07-06-24	01-07-24 to 12-07-24 22-07-24 to 02-08-24 02-09-24 to 13-09-24	14-10-24 to 25-10-24 04-11-24 to 14-11-24 02-12-24 to 13-12-24	20-01-25 to 31-01-25 03-02-25 to 14-02-25 17-02-25 to 28-02-25

**Course Contents:** Introduction to Auto Cad, drawing layouts, tool bars, file creation, creation of drawing sheet as per ISO, create line, break, erase, undo, absolute co-ordinate system, relative co-ordinate system and polar co-ordinate system, Trim, offset, fillet, chamfer commands drawing practice, drawing practice using arc, circle commands move, copy, array, insert block, make block, scale, rotate, hatch commands, creating templates, inserting layers, Drawing practice using dimensioning drawings, creating styles in dimensioning- Drawing practice using 3d primitives, extrude, revolve command setting user co-ordinate systems, rotating, plotting, print preview -

Application of Inventor in Engineering Design	241002	2 Weeks	10-06-24 to 21-06-24	17-09-24 to 27-09-24	18-11-24 to 29-11-24	03-03-25 to 14-03-25
---	--------	---------	----------------------	----------------------	----------------------	----------------------

**Course Contents:** Course Contents: Introduction to Autodesk inventor user interface, view manipulation, designing parametric parts, making work directory & tool bar settings- create 2d sketches – geometric constraints – dimensional sketches, creating basic sketched features, intermediate sketches, editing parametric parts, chamfers and fillets, holes & threads, patterning & mirroring features, thin walled parts, designing assemblies, using project files in assembly design placing components in an assembly constraining components, placing standard components, basic part design in an assembly, creating and customizing parts lists, creating balloons, setting drawing standards, drawing resources, identifying parts in an assembly, analysis and motion tools, presenting your assembly, making assembly– insert bolted connection, making detailing, drawing creation environment, base and projected views, section views, crapped views, detail views, managing views, automated dimensioning techniques, manual dimensioning techniques, revision tables and tags, introduction to design accelerators, bolted connections, annotating holes and threads, creating centre lines, symbols and leaders, simulation , introduction to plot & different ways of plotting-

## HEAT TREATMENT AND MATERIAL TESTING

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Concepts, Techniques and Practices of Mechanical Testing of Metals	241101	1 Week	06-05-24 to 10-05-24 10-06-24 to 14-06-24	22-07-24 to 26-07-24 26-08-24 to 30-08-24	14-10-24 to 18-10-24 25-11-24 to 29-11-24	06-01-25 to 10-01-25 10-02-25 to 14-02-25 10-03-25 to 14-03-25

**Course Contents:** Understanding of Programmable Controller Systems using TIA PORTAL- Identifying Common PLC Hardware, Components of Processors, I/O Systems- I/O Configurations, Creating a New Project with Ladder Logic, The Management of Screens and Controls, Alarm Management & Trending, OPC / DDE process communication with other PLCs- Entering, Editing, and Verifying Ladder Logic- Bird's eye view of TIA software, Building application based Project- Bottle filling and batch process station, working procedures and operational maintenance of MMS, IoT applications of Automation using MMS as per industry 4-0-

Concepts, Techniques and Practices of Surface NDT Methods	241102	1 Week	15-04-24 to 19-04-24 13-05-24 to 17-05-24 24-06-24 to 28-06-24	29-07-24 to 02-08-24 02-09-24 to 06-09-24	21-10-24 to 25-10-24 02-12-24 to 06-12-24	20-01-25 to 24-01-25 17-02-25 to 21-02-25 17-03-25 to 21-03-25
---	--------	--------	--	--	--	--

**Course Contents:** Introduction to Non-Destructive Testing (NDT)Types of discontinuities in weldments, Liquid penetrant inspection, Magnetic particle inspection, Ultrasonic test, Eddy current flaw detector, Practice on liquid penetrant inspection method, Practice on magnetic particle inspection method, Practice on ultrasonic inspection testing method, Practice on Eddy current inspection method

Concepts of Metallographic Preparation and Identification of Metallic Materials	241103	1 Week	22-04-24 to 26-04-24 27-05-24 to 31-05-24	01-07-24 to 05-07-24 05-08-24 to 09-08-24	04-11-24 to 08-11-24 09-12-24 to 13-12-24	27-01-25 to 31-01-25 24-02-25 to 28-02-25 24-03-25 to 28-03-25
---	--------	--------	--	--	--	--

**Course Contents:** Metallography Technique & its principles, Metallographic sampling, Mounting and preparation of metallographic specimens, Etching metallographic specimens, Overview of etchants for different materials such as steel, cast iron, aluminium, copper, etc-, Principles of metallurgical microscope, Study of microstructures and its grain size and behaviour, Practice on sample preparation, polishing and etching, Practice on viewing different type of materials with respect to its microstructural observations, Practice on type of grains and the measurement of grain sizes, Practice on macro etching-grain flow pattern ,Practice on micro-hardness test-

Concepts, Techniques and Practices of Heat Treating of Metals	241104	1 Week	29-04-24 to 03-05-24 03-06-24 to 07-06-24	08-07-24 to 12-07-24 19-08-24 to 23-08-24	18-11-24 to 22-11-24 16-12-24 to 20-12-24	03-02-25 to 07-02-25 03-03-25 to 07-03-25
---	--------	--------	--	--	--	--

**Course Contents:** Basic metallurgical theory of Heat Treatment, Introduction to steel and its mechanical properties, Purpose of heat treatment process, Rockwell hardness test, Brinell hardness test, Vickers hardness test, Different types of heat treatment, Annealing, Normalizing, Hardening, Tempering, Aus tempering, Mar tempering, Importance of Time-Temperature-Transformation (TTT) diagram, Case Hardening process and its types, Practice on Rockwell hardness test, Practice on Brinell Hardness test, Practice on Vickers hardness test, Practice on selection of heat-treating temperature, Practice on annealing process, Practice on normalizing process, Practice on hardening process, tempering process, Practice on different quenching media, Practice on Jominy-End Quench test-

# PRODUCTION TECHNOLOGY

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Manufacturing Processes and Techniques in Production Technology	241201	2 Weeks	06-05-24 to 17-05-24	01-07-24 to 12-07-24 19-08-24 to 30-08-24	14-10-24 to 25-10-24 25-11-24 to 06-12-24	03-02-25 to 14-02-25 03-03-25 to 14-03-25

**Course Contents:** Introduction, course objectives and safety in manufacturing process introduction to machines and equipment in PT section and visit to all sections of NSTI ,precision and accuracy with suitable examples and overview on quality and ppm, practice on conventional lathe inter changeability ,fit limit, tolerance and allowances as per IS and BIS standards, practice on conventional lathe, importance of cutting speed ,rpm, and feed and calculations, practice on CNC lathe cutting tool materials practice on up and down milling, jigs and fixtures, practice on up and down milling, importance heat treatment ,types and hardness testing.

Multi Skill Training on Turning and Grinding	241202	1 Week	27-05-24 to 31-05-24	22-07-24 to 26-07-24		06-01-25 to 10-01-25
--	--------	--------	----------------------	----------------------	--	----------------------

**Course Contents:** Turning on lathe machine and grinding, Plain turning, Step turning, grooming, forming shoulders and taper turning by various method, grinding a single point cutting tool and screw cutting.

Multi Skill Training on Milling and Grinding	241203	1 Week	24-06-24 to 28-06-24	05-08-24 to 09-08-24 23-09-24 to 27-09-24		24-02-25 to 28-02-25
--	--------	--------	----------------------	--	--	----------------------

**Course Contents:** Milling machine operations, plain milling , face milling, side milling, straddle milling, angular milling, gang milling, form milling, profile milling, end milling, gear cutting, helical milling.

Design and Manufacturing of Press Tools	241204	1 Week	15-04-24 to 19-04-24 03-06-24 to 07-06-24	09-09-24 to 13-09-24	16-12-24 to 20-12-24	17-03-25 to 21-03-25
---	--------	--------	--	----------------------	----------------------	----------------------

**Course Contents:** - Scope of press working and types of press tool operations theory, machining processes- turning, milling, drilling, tapping and grinding, Theory of cutting and effect of excessive and insufficient die clearance. Steps involved in designing press tool, determination of cutting force and die clearance, types of presses and selection criteria computing die thickness and margins and punch dimensioning. , Standard die sets, scrap strip & strip layout for blanking, die block and punch design ,Types of stripers, stripper design, stripping force and stock stops, Fasteners and fastening methods, Dowels and doweling methods. , die materials and heat treatment of dies and punches , jig boring, jig grinding, EDM and wire cut EDM operations for precise machining of die holes, Methods of repairing defective and worn out punches and dies, failure analysis of press tools , die setting , manufacturing of press tool (progressive tool) elements by conventional machining process viz. turning, milling, grinding, drilling, tapping etc. practical , jig boring operation of machining die holes , heat treatment press tool elements.

Multi Skill Training on Grinding- (Cylindrical and Surface Grinding)	241205	1 Week		02-09-24 to 06-09-24	04-11-24 to 08-11-24	20-01-25 to 24-01-25
--	--------	--------	--	----------------------	----------------------	----------------------

**Course Contents:** Grinding process, Grinding machines and its types, Grinding wheels and its types, Standard marking system of grinding wheel as per IS-551 – 1994, Grinding wheel shapes, sizes and applications, Selection of grinding wheels, Wheel balancing, truing and dressing, Practical: Grinding of block (six sides) by surface grinding machine with an accuracy of +/- 0.01 mm, External cylindrical grinding, Grinding a single point cutting tool practice in tool and cutter grinding machine.

# JAGUAR PLUMBING LAB

Name of the Course	Course Code	Duration	Regular Course Schedules			
			Apr 2024 – Jun 2024	Jul 2024 – Sep 2024	Oct 2024 – Dec 2024	Jan 2025 – Mar 2025
Plumbing for Advance Sanitary Fittings	241301	2 Weeks	15-04-24 to 26-04-24 06-05-24 to 17-05-24 03-06-24 to 14-06-24	01-07-24 to 12-07-24 19-08-24 to 30-08-24 02-09-24 to 13-09-24	14-10-24 to 25-10-24 18-11-24 to 29-11-24 09-12-24 to 20-12-24	10-02-25 to 21-02-25 03-03-25 to 14-03-25

**Course Contents:** Knowledge and Skills necessary to assemble , install and repair pipes, fittings and fixtures of heating, water and drainage systems, pipe fittings, and pipes composed of metals and nonmetals; join pipes; caulk joints; - install and repair plumbing fixtures such as sinks, bathtubs, water heaters, hot water tanks, repair and maintain plumbing.

## INFRASTRUCTURE AND FACILITIES

### CONFERENCE HALL AND LIBRARY

A Conference hall with a seating capacity of 40 seats equipped with modern audio-visual facilities such as Wi-Fi DLP projector, audio systems, interactive board, visual presenter, computer with internet connections etc.

A well equipped library is available for reading, reference & borrowing books. The library houses a good collection of technical books, periodicals, newspapers, wallcharts & transparencies for the use of trainees & staff



### CANTEEN AND HOSTEL

A canteen available in the campus premises with hygienic refreshment & food during working hours.

Limited Hostel Accommodation is available on first come first serve basis. Cooking inside hostel rooms is strictly prohibited. In case of nonavailability of hostel, candidates have to make their own arrangements. Limited hostel facility for Women is also available separately.

- Nominal rent of Rs.100/- per day per room.
- A spacious hostel comprising of 100 rooms with double bed accommodation is available for the trainees.
- Moderate amenities like play area with sports goods, television room, & hygienic drinking water facilities are provided for the inmates.
- Family accommodation not available.
- Located from 1km from main campus close to inner ring road at Ekkattuthangal





**ADVANCED WELDING LAB**



**PROCESS CONTROL INSTRUMENTATION LAB**



**PNEUMATIC & HYDRAULIC CONTROL LAB**



**CNC LAB**



**DRONE LAB**



**METROLOGY & ENGG.INSPECTION LAB**

**For Registration**



Institute Location: <https://maps.app.goo.gl/JmJb7og6oFv8QWLv6>

For Registration: <https://rdsdetn.in/avtsregform.php>

Website: <https://nstichennai.dgt.gov.in/>

Email: [nsti-chennai@dgt.gov.in](mailto:nsti-chennai@dgt.gov.in) / [rdsde-tn-msde@gov.in](mailto:rdsde-tn-msde@gov.in) / [stcnstichennai@gmail.com](mailto:stcnstichennai@gmail.com)

Contact: P. Namasivayam, Deputy Director @ 9444632551 for further enquiries