



# Course Catalogue

Version 5.0 / Spring 2019

*Swiss Skills for Competitive Advantage*



# About SkillSonics

## What we do

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Based in Zurich, Switzerland, with subsidiaries in India and South Africa, SkillSonics implements skills training internationally, based on industry-proven Swiss know-how and methods. The company offers complete training program packages, including courseware tailored to customer requirements. SkillSonics' products range from comprehensive courses for entry-level trainees to shorter advanced-training modules for shop floor technicians. The company also trains instructors, teachers, examiners and VET managers, conducts performance assessments and provides certification. SkillSonics adapts its programs, courseware and delivery methods to suit the needs of industries, taking into account local education and training systems as well as social and economic conditions. SkillSonics courses are delivered through in-house workshops at companies as well as public and private training institutes.

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## Main Partners

### SWITZERLAND

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#### Knowledge Partners



**INDIA**

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**Partner Company**



**Sector Skill Council Accreditation**



**Technical Partner Welding**



# Course Catalogue

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The courses in this catalogue are based on Swiss technical content and Swiss VET methodology. They are tailored to suit industry demand. SkillSonics offers a broad scope of additional services, including training content development and course design, training of instructors, teachers, examiners, master trainers and VET managers, assessment and skill-gap analysis. Depending on the type of course, the certificate is given by SkillSonics and its partners. Courses can be mapped to suit local/national benchmarks and allow local/national certification.

The courseware is available on a node locked USB Drive with hard copy option for student material. The modular SkillSonics service package comes with courseware, skill gap analysis, and infrastructure build-up, Training of trainer (ToT), Training delivery, assessment and certification.

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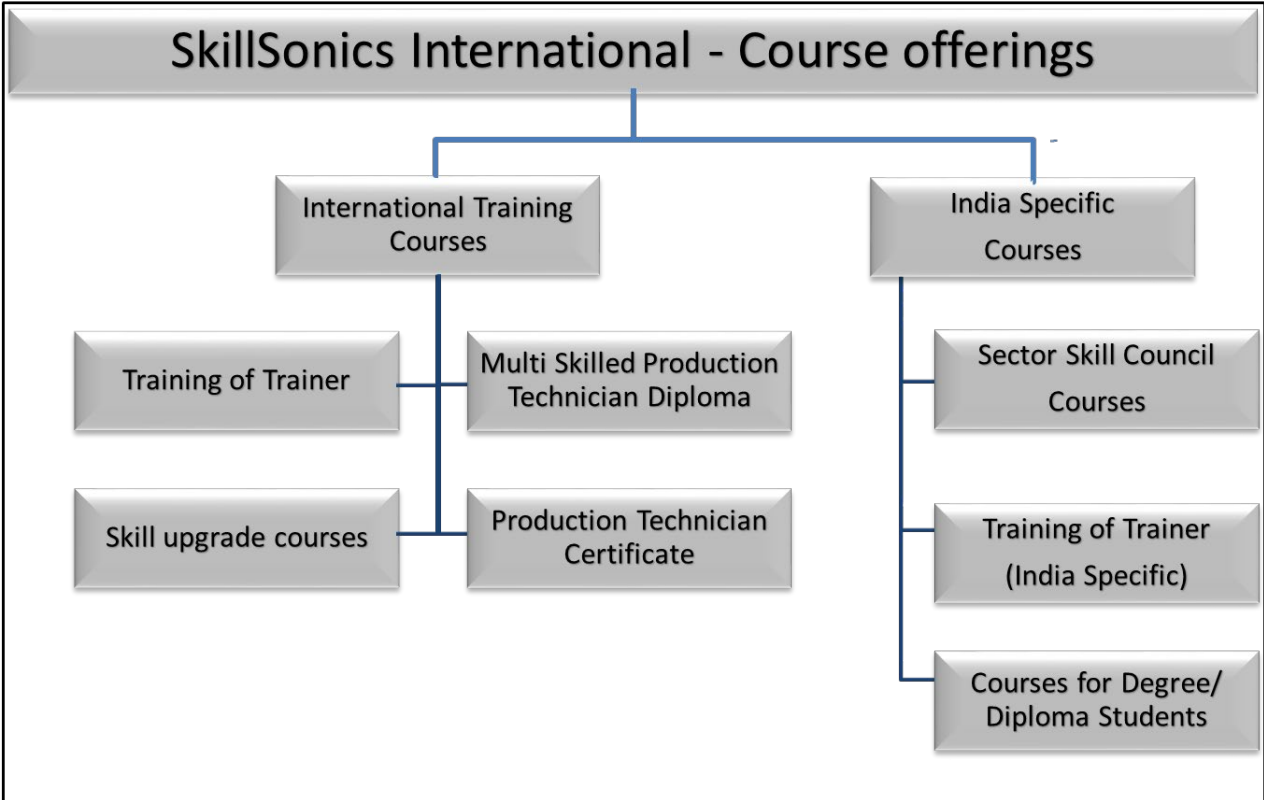
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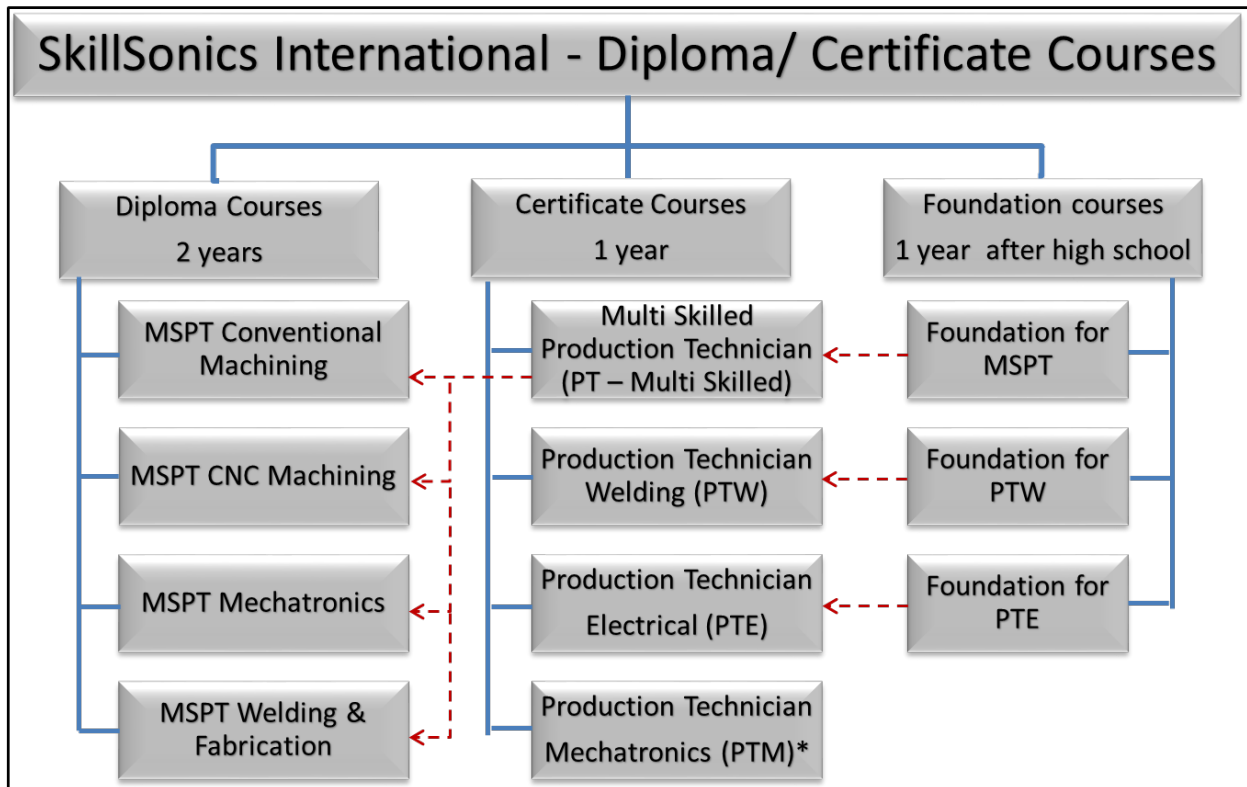
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# 1 International Training Courses





- Diploma in any one of four specialization tracks
- Certificate in any four trades
- Foundation course or Nationally recognized technical training
- ----> Lateral entry paths
- Item marked \* to be introduced soon

# 1.1 Diploma - Multi Skilled Production Technician (MSPT)

## 1.1.1 Conventional Machining

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Technical Drawing, Workshop Calculation, Material Science, Mechanical Engineering, Manufacturing Method, Mechatronics Basics, Bench Work, Basic Welding & Assembly, Conventional Turning & Milling, Advanced Conventional Turning & Milling
<b>Job Role/ Competency</b>	Multi skilled fitter mechanical assembler, conventional machinist, production floor supervisor
<b>Duration</b>	24 months
<b>Certification</b>	Diploma by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-DPT-MCH

## 1.1.2 CNC Machining

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Technical Drawing, Workshop Calculation, Material Science, Mechanical Engineering, Manufacturing Method, Mechatronics Basics, Bench Work, Basic Welding & Assembly, Conventional Turning & Milling, CNC Turning & Milling
<b>Job Role/ Competency</b>	Multi skilled fitter mechanical assembler, conventional machinist, CNC machinist, production floor supervisor
<b>Duration</b>	24 months
<b>Certification</b>	Diploma by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-DPT-CNC

### 1.1.3 Mechatronics

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Technical Drawing, Workshop Calculation, Material Science, Mechanical Engineering, Manufacturing Method, Mechatronics Basics, Bench Work, Basic Welding & Assembly, Conventional Turning & Milling, PLC & Automation, Panel Wiring
<b>Job Role/ Competency</b>	Multi skilled fitter mechanical assembler, conventional machinist, Industrial automation equipment assembler, production & process floor supervisor
<b>Duration</b>	24 months
<b>Certification</b>	Diploma by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-DPT-MCT

### 1.1.4 Welding & Fabrication

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Technical Drawing, Workshop Calculation, Material Science, Mechanical Engineering, Manufacturing Method, Mechatronics Basics, Bench Work, Basic Welding & Assembly, Conventional Turning & Milling, TIG, MIG, MAG, SMAW Welding
<b>Job Role/ Competency</b>	Multi skilled fitter mechanical assembler, conventional machinist, skilled in welding methods & weld quality, production floor supervisor in a fabrication shop
<b>Duration</b>	24 months
<b>Certification</b>	Diploma by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-DPT-WNF

## 1.2 Certificate - Production Technician (PT)

### 1.2.1 Multi Skilled

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Technical Drawing, Workshop Calculation, Material Science, Mechanical Engineering, Manufacturing Method, Automation, Bench Work, Basic Welding & Assembly, Conventional Turning & Milling,
<b>Job Role/ Competency</b>	Multi skilled fitter mechanical assembler, conventional machinist Can gain lateral entry to 2 <sup>nd</sup> year of MSPT Diploma Specialization (refer para 1.1.1 to 1.1.4)
<b>Duration</b>	12 months
<b>Certification</b>	Certificate by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-PT-MSPT

### 1.2.2 Electrical

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Basics of Electricity, Electrical Components & Electrical Equipment, Mechanical & Electrical Drawings, Electrical Fitting - Components Mounting, Panel Wiring - Cabling & Functionality Check
<b>Job Role/ Competency</b>	Electrical fitter, Industrial automation equipment assembler, carry out panel wiring & testing
<b>Duration</b>	12 months
<b>Certification</b>	Certificate by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-PT-ELE

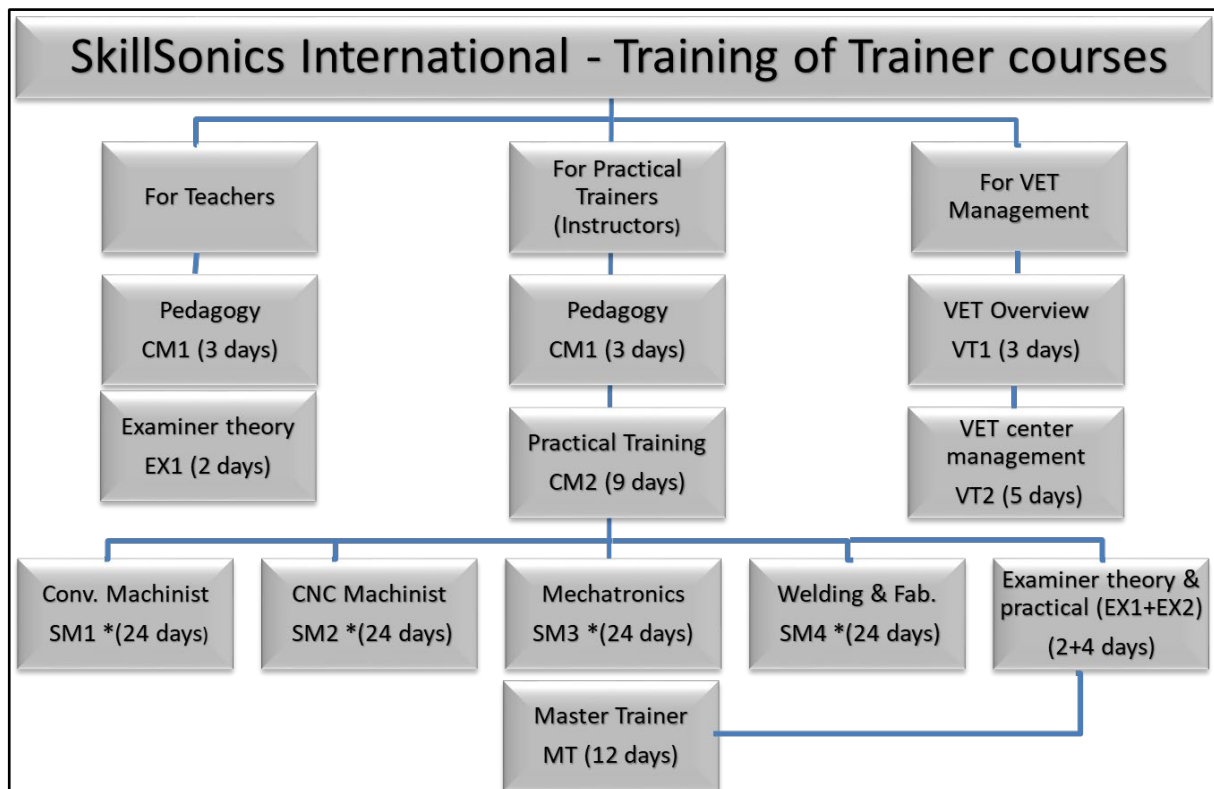
### 1.2.3 Welding & Fabrication

<b>Participants</b>	Nationally recognized technical training or Foundation course by SkillSonics completed (refer para 1.3.1)
<b>Topics</b>	Technical Drawing, Workshop Calculation, Material Science, Mechanical Engineering, Manufacturing Method, Bench Work, Sheet Metal, Arc & Gas Welding, TIG, MIG, MAG, SMAW Welding
<b>Job Role/ Competency</b>	Welding technician, weld quality assistant
<b>Duration</b>	12 months
<b>Certification</b>	Certificate by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-PT-WNF

## 1.3 VET Foundation Courses

### 1.3.1 Foundation Course for Multi Skilled Production Technician and Production Technician

<b>Participants</b>	High School with science and mathematics background
<b>Topics</b>	English Basic, Workshop Science, Engineering Drawing, Introduction to Engineering Industry, Occupation Health & Safety, Computer Literacy, Bench Work, Quality Tools, Industrial visit
<b>Job Role/ Competency</b>	To prepare to join the two year Multi Skilled Production Technician Diploma or one year Production Technician Certificate course.
<b>Duration</b>	12 months
<b>Certification</b>	Certificate by SkillSonic
<b>Course Code</b>	SIPL-VET-FD-01



<b>Pedagogy/Didactics (CM1)</b>	For teachers and instructors
<b>Applied Didactics (CM2)</b>	For instructors to deliver practical training
<b>Specialization (SM1-SM4)</b>	For certified instructors to upgrade their domain knowledge
<b>Examination (EX1, EX2)</b>	For assessors & examiners
<b>Master Trainers (MT)</b>	For Master trainers to train teachers, instructors & examiners
<b>VET Overview (VT1)</b>	For Management, HRD & Production heads
<b>VET Center Management</b>	Recommended for VET center head
<b>Certificate by</b>	SkillSonics and Swiss partner
<b>Item marked *</b>	The course duration can be 24 days or less depending on the skill level of the participants

## 1.4 Trainer and Examiner Courses

### 1.4.1 VET Instructor Course – Common Module (Basics of Applied Didactics)

<b>Participants</b>	Instructors nominated for MSPT Diploma or PT Certificate courses. Participants interested to become vocational instructor in Swiss VET training methodology
<b>Topics</b>	<p><b>Part 1 – 5 days</b> Swiss System of VET Education, Didactic Competencies &amp; Resources adapted to local environment – IPERCA, AVIVA, Cognitive apprenticeship, Competency based learning, Workshop management, Planning unit, Assessments &amp; Tests.</p> <p><b>Part 2 – 7 days</b> Instructional competencies &amp; resources – Learning Job Role, prepare, plan and perform lesson, learning plan by week</p>
<b>Job Role/ Competency</b>	Instructors so trained will be able to impart practical training following Swiss VET Instructing Methodology
<b>Duration</b>	12 days / 96 hours
<b>Certification</b>	VET Instructor by SkillSonic & Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-CM

#### 1.4.2 VET Instructor Course – Specialization in Conventional Turning & Milling

<b>Participants</b>	VET Instructors with 3 months of experience. Domain experience in Conventional Machining.
<b>Topics</b>	<b>Occupational health and safety,</b> <b>Turning</b> - Introduction to lathe and measuring instruments, tools and geometry, roughing, grooving, step turning in IT8 & IT9, center drilling, parting, tapping, taper turning, knurling, Internal turning, sleeving, ISO thread & ISO fine thread external & internal <b>Milling</b> – Introduction to milling machine, clamping & alignment of vices, plain milling, slot milling, open pocket milling, grooves & crest, cross matching milling, 5 side machining, dovetail milling
<b>Job Role/ Competency</b>	Gain sufficient practical training and instructing exposure in the field of conventional machining
<b>Duration</b>	12 - 24 days / 96 -192 hours depending on expertise level
<b>Certification</b>	Domain expert certificate by SkillSonics & Swiss
<b>Course Code</b>	SIPL-VET-QAP-SM1

#### 1.4.3 VET Instructor Course – Specialization in CNC Machining

<b>Participants</b>	VET Instructors with 3 months of experience. Domain experience in CNC Machining.
<b>Topics</b>	<b>Occupational health and safety,</b> <b>CNC Turning</b> – Introduction to CNC Turning, safety, operating and producing part, coordinate system, G & M codes, introduction to simulator, programming simple to complex programs <b>CNC Milling</b> – Introduction to CNC Milling, safety, operating and producing part, programming simple to complex programs
<b>Job Role/ Competency</b>	Gain sufficient practical training and instructing exposure in the field of CNC machining
<b>Duration</b>	12 - 24 days / 96 -192 hours depending on expertise level
<b>Certification</b>	Domain expert certificate by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-SM2

#### 1.4.4 VET Instructor Course – Specialization in Mechatronics

<b>Participants</b>	VET Instructors with 3 months of experience. Domain experience in Mechatronics.
<b>Topics</b>	<p><b>Occupational health and safety,</b></p> <p><b>Panel Wiring:</b> Knowledge of Panel wiring, related Crimping; Cabling; Glanding; Marking/Labelling; Testing using various measuring instruments. Read Wiring and Schematic Diagrams; Layout and Circuit Drawings; Installing Terminal Blocks, Relays, Contactors, Control Units, Earthing</p> <p><b>Pneumatics:</b> Generation and use of gas or pressurized/compressed air; Understanding functionality of components - Air Pumps; Accumulators; Filter, Regulator, Lubricator, Valves, Solenoids, Actuators. Configuring and Assembling pneumatic systems; Testing and Calibrating.</p> <p><b>Programmable Logic Controller:</b> Knowledge of Logic Gates; Number Systems; I/O and Module Addressing Techniques; Understanding functionality of components - PSU, CPU, Digital &amp; Analog I/O, Counters, Timers &amp; Flags, I/F Modules. Configuring and Assembling PLC systems; Wiring Field Devices. Programming in LAD; FBD; STL; Simulating and Testing.</p>
<b>Job Role/ Competency</b>	Gain sufficient practical training and instructing exposure in the field of Mechatronics
<b>Duration</b>	12 - 24 days / 96 -192 hours depending on expertise level
<b>Certification</b>	Domain expert certificate by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-SM3

### 1.4.5 VET Instructor Course – Specialization in Welding & Fabrication

<b>Participants</b>	VET Instructors with 3 months of experience. Domain experience in Welding and Fabrication.
<b>Topics</b>	<p><b>Occupational health and safety,</b></p> <p><b>MMAW</b> – Welding equipment, electrodes, metallurgy, welding joints and joint preparation, welding in 1G,2G,3G,1F,2F,3F positions</p> <p><b>Oxy-Acetylene welding</b> – Welding equipment, safety, parameter setting and edge preparation, gouging and purging, exercises</p> <p><b>MIG/MAG welding</b> – Welding equipment, safety, parameter setting, welding in 1G,2G,3G and 1F,2F,3F welding positions, inspection</p> <p><b>TIG welding</b> – Welding equipment, safety, parameter setting, exercises in MS and Aluminum welding</p> <p>NDT testing, welding procedure specifications, ASME standards</p>
<b>Job Role/ Competency</b>	Gain sufficient practical training and instructing exposure in the field of Welding and Fabrication.
<b>Duration</b>	12 - 24 days / 96 -192 hours depending on expertise level
<b>Certification</b>	Domain expert certificate by SkillSonics & Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-SM4

#### 1.4.6 VET Master Trainer Course

<b>Participants</b>	Instructors preparing to become Swiss VET Master Trainers. Pre-requisite: Swiss VET instructors with 3 months of instructing experience and Swiss VET examiner with semester exam experience.
<b>Topics</b>	Learning & Teaching, Planning with AVIVA, Situated knowledge approach, Didactical Knowledge, Applying didactical knowledge to improve own teaching, Assessment
<b>Job Role/ Competency</b>	Master Instructors so trained will be able to train VET instructors and examiners. They serve as trainer multipliers in an organization.
<b>Duration</b>	8 days / 64 hours
<b>Certification</b>	Qualified Master Trainer certificate by SkillSonic and Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-MT

#### 1.4.7 VET Examiner Course

<b>Participants</b>	Instructors preparing to become Swiss VET Examiners Swiss VET instructors with 12 months of instructing experience.
<b>Topics</b>	What is an assessment, core elements of good assessment, role and responsibility of an examiner, conducting assessments, evaluation & control of assessments, live assessment, difficult situations during examination, reporting.
<b>Job Role/ Competency</b>	The Swiss VET examiner will be able to independently carry out semester/ final assessments of apprentices.
<b>Duration</b>	6 days / 48 hours
<b>Certification</b>	Qualified Examiner Certificate by SkillSonic & Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-EX

## 1.5 Training Manager Courses

### 1.5.1 VET Manager Course

<b>Participants</b>	Part 1 for senior HR & production managers, VET Training head and staff associated with VET training Part 2 for VET Training head and staff associated with VET training
<b>Topics</b>	<b>Part 1- VT1 - 3 days</b> Oversee VET training center, Reporting training activities, Recruitment & placement of apprentices, Leading coaching and counselling <b>Part 2 – VT2 - 5 days</b> Instructional competencies (AVIVA, IPERCA), Training calendar, Train the Trainer programs, Assessment and exams, Communication and Feedback, Reporting and liaison
<b>Job Role/ Competency</b>	To be able to manage the Vocational Training Center as per the Swiss VET training standards adapted to local environment.
<b>Duration</b>	8 days / 64 hours
<b>Certification</b>	Part 1 - Participation Certificate by SkillSonic Part 1&2 - Qualified VET Manager Certificate by SkillSonic & Swiss Partner
<b>Course Code</b>	SIPL-VET-QAP-VT

## 1.6 Skill Upgrade Courses

(Short-term courses for maintenance of equipment used in manufacturing and processing industry)

### 1.6.1 General Work Skills

#### 1.6.1.1 Industrial Safety

<b>Participants</b>	Industrial workforce engaged in production & servicing
<b>Topics</b>	General Safety, Electrical Safety, Isolation & Lockout, Hot Works, Confined Space, Machine Guard, Lifting Support Load, Working at Height, Vehicle Traffic, Railway Safety, First Aid
<b>Job Role / Competency</b>	Aware of following safety for the benefit of individual & organization, how to react to an emergency situation
<b>Duration</b>	3 days / 24 hours
<b>Course Code</b>	SIPL-STC-WSG-01

#### 1.6.1.2 Life Skills

<b>Participants</b>	Industrial workforce engaged in production & servicing
<b>Topics</b>	Health, Habits, Attitude, Discipline Housekeeping -5S, Communications, Motivation, Working with Team, Value of Time
<b>Job Role / Competency</b>	Improve the work environment in a factory, improve the employee's soft competencies
<b>Duration</b>	3 days / 24 hours
<b>Course Code</b>	SIPL-STC-WSG-02

## 1.6.2 Electrical Basics

### 1.6.2.1 Basics of Electricity

<b>Participants</b>	Technicians engaged in electrical production, service or quality control, also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	Electricity, Electrical Symbols, Conductor, Insulator & Semi-Conductors, Cables & Crimping, Voltage, Current & Resistance, AC DC Voltage
<b>Job Role / Competency</b>	Introduction to fundamentals of electricity & electrical components
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELF-01

### 1.6.2.2 Lighting System Basics

<b>Participants</b>	Technicians engaged in electrical production, service or quality control, also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	Lighting Terms, Lighting Distribution System, Lux Measurement, Lights & Light Fixtures, Maintenance
<b>Job Role / Competency</b>	Understand the different light fittings & their efficiencies, and the importance of proper light distribution at workplace
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELF-02

### 1.6.2.3 Motor Basics

<b>Participants</b>	Technicians engaged in electrical production, service or quality control, also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	DC Motors: classification & construction, AC Motors: classification & construction, Star Delta Connection, Name Plate & Mounting Methods, Inspection & Maintenance of Motors
<b>Job Role / Competency</b>	Understand DC motors: their troubleshooting & maintenance and understand LT & HT motors: their construction, troubleshooting & maintenance
<b>Duration</b>	1.5 days / 12 hours
<b>Course Code</b>	SIPL-STC-ELF-03

### 1.6.2.4 Motor Starter Basics

<b>Participants</b>	Technicians engaged in electrical production, service or quality control, also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	Motor Starters & Classification, DOL Starters, Star Delta Starters, Starter Maintenance, Soft Starters, GRR, LRS
<b>Job Role / Competency</b>	Understand AC & DC starters, soft starters, LRS & GRR starters
<b>Duration</b>	1.5 days / 12 hours
<b>Course Code</b>	SIPL-STC-ELF-04

### 1.6.2.5 Electrical Safety

<b>Participants</b>	Technicians engaged in electrical production, service or quality control, also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	Hazards of Electricity, LOTOTO, Electrical Shock & Severity, Hazardous Environment, Accident Prevention, Earthing & Electrical Safety Devices, Fire Extinguishers & First Aid
<b>Job Role / Competency</b>	Understand and able to apply safe practices to be followed in electrical working, electrical hazard causes & prevention & first aid procedure
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELF-05

### 1.6.2.6 Low Tension Switchgear Basics

<b>Participants</b>	General understanding
<b>Topics</b>	Switchgear Safety, Classifications, LT Panels, Components, Switches, Fuses, ACB, MCB, MCCB, Contactors, Timers, Overload Relays, Bus Bar System, Cabling, Instrumentation, Preventive Maintenance & Troubleshooting
<b>Job Role / Competency</b>	Understand and able to apply the function of LT switchgears & its components, rack in rack out procedure, general troubleshooting
<b>Duration</b>	3 days / 24 hours
<b>Course Code</b>	SIPL-STC-ELF-06

### 1.6.2.7 High Tension Switchgear Basics

<b>Participants</b>	General understanding
<b>Topics</b>	HT Switchgear Safety, Classification, HT Panels, Components, HT Circuit Board, Bus Bars, Current & Potential Transformers, Fuses, Protective Relays, HT Cables
<b>Job Role / Competency</b>	Understand and able to apply the function of HT switchgears & its components, rack in rack out procedure, general troubleshooting
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELF-07

### 1.6.2.8 Distribution Transformer Basics

<b>Participants</b>	General understanding
<b>Topics</b>	Transformer Classification, Construction, Cooling System, Transformer Oil, Insulation Classes, Protection, Mounting, Transformer Testing, Condition Monitoring & Maintenance
<b>Job Role / Competency</b>	Understand and able to apply the function of distribution transformer & basic maintenance
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELF-08

### 1.6.2.9 Power Generation & Transmission Basics

<b>Participants</b>	General understanding
<b>Topics</b>	Power Generation, Thermal & Diesel Power Plant, Transmission Line Classification, Components, Underground Power Lines, Maintenance of Transmission Lines
<b>Job Role / Competency</b>	Understand and able apply different power generation methods, transmission and distribution of power and basics of transmission line maintenance
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELF-09

### 1.6.2.10 Distribution Switch-yard Basics

<b>Participants</b>	General understanding
<b>Topics</b>	Distribution Switch Yard & Components, HT Capacitors, Earthing & Earth Mat, Bus System & Bus Duct, Troubleshooting & Maintenance, Grid Synchronization & Reactors, Station Batteries
<b>Job Role / Competency</b>	Understand how transmitted power is received at sub-station, importance of earthing & lightning arrestors for safety, different bus switching configurations, general troubleshooting & maintenance of sub-station
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELF-10

### 1.6.2.11 Energy Management System Basics

<b>Participants</b>	General understanding
<b>Topics</b>	Measuring Instruments, Direct Mounted Meters, Panel Mounted Meters, Hand-held Meters, Digital Power Meters, Energy Management Systems
<b>Job Role / Competency</b>	Able to utilize measuring instruments used for power monitoring and understand importance of energy management & control
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELF-11

### 1.6.2.12 Air Dryer, Air Conditioning & PV Systems

<b>Participants</b>	General understanding
<b>Topics</b>	Air Dryer Purpose & Classification, Air-conditioning Principle of Operation, Air Handling Unit, Chiller Water Unit, Pressure & Ventilating System
<b>Job Role / Competency</b>	Understand and able to apply fundamentals, application & general maintenance of air dryers, air-conditioning & pressure & ventilating systems
<b>Duration</b>	2 day / 16 hours
<b>Course Code</b>	SIPL-STC-ELF-12

### 1.6.3 Electrical Maintenance

#### 1.6.3.1 LT Switchgear Maintenance

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Electrical Safety, PCC & MCC Diagrams, LT Switchgear Components, MCB / MCCB / MPCB Maintenance, Protection & Overload Devices, Switchgear Isolation & Repair
<b>Job Role / Competency</b>	Understand LT Switchgear & its components in greater detail, safety to be followed in LT switchgear maintenance, trouble shooting & maintenance of LT panels and able to set overload & protection parameters
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELM-01

#### 1.6.3.2 HT Switchgear Maintenance

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	HT Safety, HT Breakers MOCB, SF6, VCB, HT Protection Devices Fuses, CT, PT, IDMT Relays, HT Switchgear Drawings Study, Trouble Shooting & Case Study
<b>Job Role / Competency</b>	Understand HT panels, protection & components, able to read HT switchgear, drawings, isolation & plug-in procedure, trouble shooting of HT panels
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELM-02

### 1.6.3.3 Thermography

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Thermography, Thermal Imaging & Prediction of Failures
<b>Job Role / Competency</b>	Understand thermography in maintenance of electrical system panels, switchgears, transformer windings, transmission & distribution equipment
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-ELM-03

### 1.6.3.4 DC Motor Maintenance

<b>Participants</b>	For service technicians engaged in electrical motor maintenance
<b>Topics</b>	Recap on Electrical Safety, DC Motors Classification, Motor Construction & Characteristics, Troubleshooting & Maintenance, DC Motor Starters, Commutator & Brush Mounting & Care
<b>Job Role / Competency</b>	Understand safety to be followed in DC motor maintenance, troubleshoot & maintain DC motors, able to utilize the commonly experienced commutator faults & prevention
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELM-04

### 1.6.3.5 AC Motor Maintenance

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Recap on Electrical Safety, AC Motor Classifications, HT / LT, Single Phase / Three Phase, Induction, Slip Ring, Synchronous Motors, Troubleshooting of AC Motors, Overhauling of Motors
<b>Job Role / Competency</b>	Able to identify AC motor types & its parts, understand different motor connections and basic approach to maintenance of motors used in industry
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELM-05

### 1.6.3.6 Starter Maintenance

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Introduction to AC Starters, DOL, Star Delta Starters, Soft Starters & their characteristics, GRR & LRS Starters
<b>Job Role / Competency</b>	Understand different AC motor starters & their applications. Ability to inspect contactors for burnout
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELM-06

### 1.6.3.7 CBM Techniques in Electrical Maintenance

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Introduction to CBM Techniques, Polarization Index, Partial Discharge, TAN Delta Test, Motor Current Signature Analysis
<b>Job Role / Competency</b>	Introduced to CBM techniques for electrical equipment, IR, PI, PD, TAN Delta tests, motor current signature analysis
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELM-07

### 1.6.3.8 Power Generation

<b>Participants</b>	For service technicians engaged in CPP & Switchgear maintenance
<b>Topics</b>	Electrical Safety, Power Sources Grid Power, Captive Power Plants, Thermal Power Plants, DG Power Plant, Grid Synchronization, Banking & Wheeling
<b>Job Role / Competency</b>	Understand different power generation methods, captive power plants process flow & components, importance of grid synchronization & able to achieve it
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELM-08

### 1.6.3.9 Transmission & Distribution

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Transmission Schematic, Towers & Components, Distribution Switchyard, Substation Bus Configurations, Earthling & Protection, CT & PT Testing, Power Factor Control
<b>Job Role / Competency</b>	Understand maintenance of substation, different bus configurations, maintenance of proper earth & lightning protection, CT & PT testing & keeping power factor within limits
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELM-09

### 1.6.3.10 Distribution Transformer Maintenance

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Distribution Transformer & its components, Offline & Online Tap Changers, Maintenance of Transformer, IR, PI, PD & TAN Delta Test, Oil Analysis, Dissolved Gas Analysis, Furan Analysis
<b>Job Role / Competency</b>	Able to maintain distribution transformers, distribution transformer tests - IR, PD, PI, TAN Delta, oil analysis, DGA, FURAN tests to determine its health
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-ELM-10

### 1.6.3.11 Energy Management & Energy Conservation

<b>Participants</b>	For service technicians engaged in switchgear maintenance
<b>Topics</b>	Hysteresis & Eddy Current Losses, Harmonics: Causes, Effect & Control Methods, Energy Management, Energy Conservation Methods
<b>Job Role / Competency</b>	Understand how important it is to contain electrical losses and know methods of improving power quality
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELM-11

### 1.6.3.12 ESP Working & Maintenance

<b>Participants</b>	For service technicians engaged in ESP maintenance
<b>Topics</b>	Electrostatic Precipitator working principle, Construction & Components, Rapping Device & Conditioning Tower, Transformer Cum Rectifier, ESP Maintenance
<b>Job Role / Competency</b>	Understand electrostatic precipitator working principle, construction & components, rapping device & conditioning tower, transformer cum rectifier & maintenance
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-ELM-12

## 1.6.4 Mechanical Basics

### 1.6.4.1 Mechanical Measurements & Measuring Instruments

<b>Participants</b>	Technicians engaged in mechanical production, service or quality control, also suitable for graduating apprentice to improve their knowledge in the subject
<b>Topics</b>	Measurements Basics, Measuring Instruments, Common Errors in Measurements, Linear & Geometric Fits & Tolerance, Use of Go, No-Go Gauges
<b>Job Role / Competency</b>	Understand commonly used measuring instruments, able to avoid errors in measurements, recognize the implication of errors in measurements
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCF-01

### 1.6.4.2 Technical Drawing Basics

<b>Participants</b>	Technicians engaged in mechanical production, service or quality control, also suitable for graduating apprentice to improve their knowledge in the subject
<b>Topics</b>	Introduction to Views, Cuts & Sections, Dimensioning, Threaded Joints, Welded Joints, Surface Finish, Free-Hand Drawings, Reading Production Drawings
<b>Job Role / Competency</b>	Understand commonly used notations in engineering drawings, practice reading sample drawings used in a plant and able to draw free hand sketches for workshop jobs
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCF-02

### 1.6.4.3 Technical Drawing Advanced

<b>Participants</b>	For precision manufacturing & servicing
<b>Topics</b>	Recap of Technical Drawing Basics, Limits, Fits & Tolerances, Geometric Tolerances
<b>Job Role / Competency</b>	Understand importance of limits, fits & tolerances in component assembly, equipment alignment
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-MCF-03

### 1.6.4.4 Lubrication Basics

<b>Participants</b>	Technicians engaged in mechanical production, service or quality control, also suitable for graduating apprentice to improve their knowledge in the subject
<b>Topics</b>	Lubrication & its Importance, Lubricants & Lubrication Methods, Under & Over Lubrication, Seals, O-rings & Gaskets
<b>Job Role / Competency</b>	Understand the importance of lubrication and how seal protects lubricated area from contamination, know right method of lubrication
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-MCF-04

#### 1.6.4.5 Pneumatics Basics

<b>Participants</b>	Technicians engaged in mechanical production, service or quality control, also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	What is Pneumatics, Pneumatic Application & Components, Electro-Pneumatics, Pneumatic Drawings & Symbols, Safety & Maintenance of Pneumatic Systems
<b>Job Role / Competency</b>	Able to identify pneumatic components, know basic approach to maintenance of such equipment used in industry and basic trouble shooting & probable reasons of failure of such equipment
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCF-05

#### 1.6.4.6 Hydraulics Basics

<b>Participants</b>	Technicians engaged in mechanical production, service or quality control, Also suitable for graduating apprentices to improve their knowledge in the subject
<b>Topics</b>	Hydraulics & its Application, Hydraulic Components, Hydraulic Drawings & Symbols, Hydraulic Hazards & Safety, Maintenance of Hydraulic Systems
<b>Job Role / Competency</b>	Able to identify hydraulic components, know basic approach to maintenance of such equipment used in industry and basic trouble shooting & probable reasons of failure of such equipment
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCF-06

#### 1.6.4.7 Electrical & Instrumentation Primer

<b>Participants</b>	General applicability
<b>Topics</b>	Basics of Electricity, AC & DC System, Earthing Systems, Electrical Safety & First Aid, Transmission & Distribution, Electrical Devices, Basics of Instrumentation, Sensors, Transducers & Actuators, Safety Devices, Device Tags
<b>Job Role / Competency</b>	Technicians, supervisors in mechanical stream, understand basics of instrumentation & electrical engineering
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCF-07

#### 1.6.4.8 Slings & Bolt Strength

<b>Participants</b>	For material handling staff & service technicians who need to use slings
<b>Topics</b>	Strength of Bolt, how much Torque to apply, Slings & its Types, Load carrying capacity, Safety in Slings & Sign language for material handling
<b>Job Role / Competency</b>	Understand the importance of fastening bolts, their strength & tightening torque to be applied, understanding of slings, their load carrying capacity & care in handling of slings
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-MCF-08

## 1.6.5 Mechanical Component Basics

### 1.6.5.1 Bearings Basics

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Principle of Bearing & Classification, Bearing Housing, Bearing Mounting & Dismounting, Large & Dismountable Bearings, Bearing Maintenance
<b>Job Role / Competency</b>	Know types of bearings, housing & adapter sleeves, assembly & disassembly of bearings, able to identify the bearings used in industry & troubleshoot bearing failures, probable reasons for failure & maintenance of bearings
<b>Duration</b>	1.5 days / 12 hours
<b>Course Code</b>	SIPL-STC-MCF-09

### 1.6.5.2 Couplings Basics

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	What is Coupling, Coupling Types & its Applications, Coupling Maintenance & Failure, Coupling Specifications
<b>Job Role / Competency</b>	Know different types of couplings & their application, coupling mounting & dismounting & coupling clearances
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCF-10

## 1.6.5.3 Gear Basics

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Gear Types & Function, Gear Boxes & Auxiliaries, Auxiliary Devices, Predictive Maintenance of Gear Boxes
<b>Job Role / Competency</b>	Know types of gears & gear boxes, familiarization with gear box auxiliaries, troubleshooting of gear boxes & probable reasons for failure
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCF-11

1.6.6 **Mechanical Equipment Basics**

1.6.6.1 Diesel Engine Basics

<b>Participants</b>	General applicability
<b>Topics</b>	Basics of Diesel Engine, Components of Diesel Engine, Fuel Injection System, Sub-Assemblies, Transmission System
<b>Job Role / Competency</b>	Understand different types of engines & transmission systems, know commonly experienced starting problems in diesel engines
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCF-12

## 1.6.7 Mechanical Maintenance

### 1.6.7.1 Foundation & Leveling

<b>Participants</b>	Service technicians & engineers engaged in equipment maintenance & installation
<b>Topics</b>	Instruments used for Leveling, Equipment Foundation Types, Basics of Equipment Leveling
<b>Job Role / Competency</b>	Able to use instruments used for leveling, understand equipment foundation, curing & leveling
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCM-01

### 1.6.7.2 Shaft Alignment Basics

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Basics of Alignment & Tools for Alignment, Types of Machine Misalignment, Straight Edge Method, Rim & Face Method, Using Dial Gauge, Alignment Related Problems
<b>Job Role / Competency</b>	Understand the need for correct alignment, able to analyze & discuss the reasons for misalignment, consequences of misalignment on operation & maintenance of machines, apply skills to do alignment more effectively, select & list out the necessary tools required for alignment
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCM-02

### 1.6.7.3 Shaft Alignment Advanced

<b>Participants</b>	Service technicians & engineers engaged in equipment maintenance & installation
<b>Topics</b>	What is Soft Foot, its causes & correction, Standard Shaft & Long Shaft Alignment, Long Shaft Alignment, Using Dial Gauge, Laser Alignment Equipment & Accessories, Laser Sweep & Multi Point Alignment Method, Effect of Thermal Expansion on Alignment
<b>Job Role / Competency</b>	Understand importance of fixing soft foot before doing alignment, practice standard & long shaft alignment using dial gauge, use laser alignment equipment & accessories, able to compensate for misalignment due to thermal expansion
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCM-03

### 1.6.7.4 Bearing Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Recap of Lubrication Basics, Oil Seal Types, Mounting, Common Problems & Solutions, Bearing Types, Application & Selection, Bearing Damages, Probable Causes & Cure, Points to check & identify Spurious Bearings
<b>Job Role / Competency</b>	Able to identify bearing types, their application & selection, study bearing damages, determine probable causes & possible cure, how to identify spurious bearings
<b>Duration</b>	3 days / 24 hours
<b>Course Code</b>	SIPL-STC-MCM-04

### 1.6.7.5 Open Gears & Gear Box Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Gears & Lubrication Basics, Open Gear Alignment & Inspection, NDT Techniques of Gear Inspection, Study Teeth Wear Pattern & Wear Causes, Gear Box Inspection & Type of Inspections, Gear Box Troubleshooting & Maintenance
<b>Job Role / Competency</b>	Recap on gears & lubrication basics, understand open gear basics & identify potential issues, understand gear box types, its construction, inspection & maintenance
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCM-05

### 1.6.7.6 Compressor Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Recap of Lubrication, Bearings & Coupling, Compressor Classification & Application, Compressor Components & the commonly encountered problems & solutions
<b>Job Role / Competency</b>	Understand types of compressors, their construction & advantages, assembly & safety precautions, screw & reciprocating compressors, potential issues & probable causes
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCM-06

### 1.6.7.7 Pump Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Recap of Lubrication, Bearings & Coupling, Principle of Pump Operation, Pump Classification & Application, Preventive Maintenance Schedule & the commonly encountered problems & solutions
<b>Job Role / Competency</b>	Understand principles of pump operation, pump types & their application, understand & implement preventive maintenance schedule, able to identify commonly encountered issues while handling pumps & causes of failure
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCM-07

### 1.6.7.8 PD Blower Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Blower & its Classifications, Blower Components, Troubleshooting & Maintenance of PD Blowers
<b>Job Role / Competency</b>	Carry out performance measurement of PD blowers & trouble shooting
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCM-08

### 1.6.7.9 Pneumatic Equipment Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Recap of Pneumatic System Basics, Pneumatic System Components, Trouble Shooting & Maintenance, Pneumatic Conveying System, Study of typical Pneumatic Systems
<b>Job Role / Competency</b>	Understand fundamentals of pneumatics, air generation & distribution, actuators, valves, systems, application, safety interlocks & controls, troubleshooting & maintenance of pneumatic system
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCM-09

### 1.6.7.10 Hydraulic Equipment Maintenance

<b>Participants</b>	For service technicians engaged in equipment maintenance
<b>Topics</b>	Recap of Hydraulics Basics, Hydraulic Basic Laws, Hydraulic Fluids, Hydraulic System Components, Troubleshooting & Maintenance, Hydraulic Safety
<b>Job Role / Competency</b>	Introduced to hydraulics, basic laws & hydraulic fluids, learns pumps, hydro motors, filters, valves, symbols, cylinders & accumulators, understand hydraulic cylinder failures, troubleshooting hydraulic systems
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCM-10

#### 1.6.7.11 Vibration Analysis

<b>Participants</b>	Experienced service technicians & engineers engaged in condition based maintenance & monitoring
<b>Topics</b>	Vibration Basics, Instruments used for Vibration Check, Vibration Spectrum Analysis
<b>Job Role / Competency</b>	Understand the importance of vibration analysis in predictive maintenance, able to use vibration analyzer
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-MCM-11

#### 1.6.7.12 Static & Dynamic Balancing

<b>Participants</b>	Experienced Service technicians & engineers engaged in condition based maintenance & monitoring
<b>Topics</b>	Principles of Balancing, Static & Dynamic Balancing, Tools & Instruments for Balancing, Dynamic Balancing using Vector Diagram Method, Dynamic Balancing with Phase Measurement
<b>Job Role / Competency</b>	Understand principles of static & dynamic balancing, able to carry out balancing & check the reduction in vibration
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-MCM-12

### 1.6.7.13 NDT for Welded Joints

<b>Participants</b>	Experienced service technicians & engineers engaged in condition based maintenance & monitoring
<b>Topics</b>	Non-Destructive Testing Techniques, Types of Weld Defects, Visual Inspection, Magnetic Particle Testing, Dye Penetration Test, Radiography, Ultra Sound & Leak Test
<b>Job Role / Competency</b>	Able to do quality check using NDT techniques
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-MCM-13

### 1.6.7.14 Wear Measurement

<b>Participants</b>	Experienced service technicians & engineers engaged in condition based maintenance & monitoring
<b>Topics</b>	Wear Type & Causes, Wear Remedy Methods, Methods of Wear Measurements, Weir Inspection Schedule
<b>Job Role / Competency</b>	Understand importance of measuring wear regularly to plan repair or replacement
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-MCM-14

1.6.7.15 Maintenance Planning

<b>Participants</b>	General applicability
<b>Topics</b>	Maintenance Classification, Benefits of Predictive Maintenance, Planning for Maintenance & Reporting
<b>Job Role / Competency</b>	Understand maintenance types & reporting methods
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-MCM-15

## 1.6.8 Instrumentation Basics

### 1.6.8.1 Basics of Instrumentation

<b>Participants</b>	General applicability
<b>Topics</b>	Introduced to Instrumentation, Instrumentation Diagrams, Relay & PLC, Distributed Control System (DCS), PLC Programming & Basic Troubleshooting, PID Controllers
<b>Job Role / Competency</b>	Understand instrumentation & their types, what is a PLC, basic block diagram & method of programming, able to use distributed control systems & user interface
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INF-01

### 1.6.8.2 Basics of Sensors & Transducers

<b>Participants</b>	General applicability
<b>Topics</b>	Basics of Sensors & Transducers, Temperature, Pressure, Level, Vibration Sensor Switches, Limit Switches, Pull Cord, Sway Switches, Flow Meters, Load Cell, LVDT
<b>Job Role / Competency</b>	Know about sensors & transducers, their types & application
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INF-02

### 1.6.8.3 Drive Basics

<b>Participants</b>	General applicability
<b>Topics</b>	Basics of Drives & Drive Electronics, DC Drives Working, Maintenance & Troubleshooting, AC Variable Frequency Drives, VFD Drives Maintenance
<b>Job Role / Competency</b>	Introduced to basic block diagram of DC drives & AC drives and the maintenance of such drives
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INF-03

### 1.6.8.4 Solid Flow Meters & Weigh Bridges

<b>Participants</b>	For service technicians engaged in mineral processing industry maintenance
<b>Topics</b>	Solid Flow Meter Feeders, Impact Type, Coriolis Type, Loss in Weight Type, Rotor Scale Bulk Handling System, Weigh Feeder, Belt Feeder, Weigh Bridges
<b>Job Role / Competency</b>	Understand different types of weighing systems used in mineral processing industry able to calibrate & maintain weighing systems
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INF-04

### 1.6.8.5 Fiber Optic Systems

<b>Participants</b>	General applicability
<b>Topics</b>	Basics of Fiber Optics, Single Mode & Multi Mode Transmission, Splicing, Amplifiers & Repeaters
<b>Job Role / Competency</b>	Understand and apply principles behind the working, types of cables, construction & advantages of fiber optic system
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-INF-05

### 1.6.8.6 Uninterrupted Power Supply (UPS)

<b>Participants</b>	General applicability
<b>Topics</b>	UPS Systems & Components, UPS Types & Classification, Batteries & their Maintenance, Safety when Servicing
<b>Job Role / Competency</b>	Understand basics of UPS systems & their maintenance
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-INF-06

## 1.6.9 Instrumentation Maintenance

### 1.6.9.1 Process Control Systems

<b>Participants</b>	General applicability
<b>Topics</b>	Process Control Basics, PI & PID Controls, PLC Programming, PLC Troubleshooting
<b>Job Role / Competency</b>	Understand applications of process control systems, PI & PID controls, programming of PLC & maintenance & trouble-shooting of PLC
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INM-01

### 1.6.9.2 Sensors, Transducers & Transmitters

<b>Participants</b>	For service technicians engaged in industry automation maintenance
<b>Topics</b>	Recap: Instrumentation, Sensors & Transducers, Temperature, Level, Pressure, Flow, Speed Sensors, Actuators: Electrical, Hydraulic & Pneumatic
<b>Job Role / Competency</b>	Able to calibrate temperature, pressure, level sensors & transmitters, understand the working of actuators, different kinds of actuators & related terminologies such as open limit, closed limit, torque & calibration
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INM-02

### 1.6.9.3 Analyzers

<b>Participants</b>	For service technicians engaged in mineral processing Industry maintenance
<b>Topics</b>	Analyzer & its Applications, Working Principle, XRF, XRD, PGNAA Analyzers, Calibration of Analyzers
<b>Job Role / Competency</b>	Understand the basics of analyzers, types of analyzers (gas analyzers (O <sub>2</sub> , CO <sub>2</sub> ), XRF analyzer (chemical analysis), PGNAA (lime stone analyzer))
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-INM-03

### 1.6.9.4 Weigh Bridge Systems

<b>Participants</b>	For service technicians engaged in mineral processing industry maintenance
<b>Topics</b>	Weighing Systems, Types of Weighing Systems, Load Cell, Types, Troubleshooting of Load Cells, Calibration of Load Cells
<b>Job Role / Competency</b>	Introduced to weighing systems, load cell types & calibration, parameters such as repeatability, span adjustment, known weight test, out of calibration & on load cell calibration
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-INM-04

### 1.6.9.5 DC Drive & VFD Maintenance

<b>Participants</b>	For service technicians engaged in industry automation maintenance
<b>Topics</b>	DC Drives used in Control Systems, 4 Quadrant DC Drives, Maintenance & Troubleshooting of DC Drives, VF Drives Working Principle, VFD Control Methods Troubleshooting of VFD Drives
<b>Job Role / Competency</b>	Understand the necessity of DC drives, their advantages & working, introduced to maintenance of drives & troubleshooting, understand the necessity of VF drives, their advantages & working, introduced to maintenance of drives & troubleshooting
<b>Duration</b>	2 days /16 hours
<b>Course Code</b>	SIPL-STC-INM-05

1.6.10 **Cement Basics**  
1.6.10.1 Cement Manufacturing

<b>Participants</b>	For those who would like to understand how cement is manufactured
<b>Topics</b>	Cement Manufacturing Process, Types of Cement, Raw Materials for Cement, Cement Chemistry, Quality Control, Plant Management, Pollution Control, Application of Cement
<b>Job Role / Competency</b>	Understand the cement manufacturing process, cement types, properties & application
<b>Duration</b>	3 days / 24 hours
<b>Course Code</b>	SIPL-STC-CMF-01

1.6.11 **Cement Plant Maintenance**

1.6.11.1 Belt Conveyor & Air Slide

<b>Participants</b>	For service technicians in mineral processing industry
<b>Topics</b>	Application & Construction, Troubleshooting, Preventive Maintenance, Equipment Safety
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-CMM-01

1.6.11.2 Bag Filter & Elevator

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Application & Construction, Troubleshooting, Preventive Maintenance, Equipment Safety
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-CMM-02

### 1.6.11.3 Rotary Packer

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Application & Construction, Troubleshooting, Preventive Maintenance, Equipment Safety
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-CMM-03

### 1.6.11.4 Rotary Kiln

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Application & Construction, Troubleshooting, Preventive Maintenance, Equipment Safety
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1.5 days / 12 hours
<b>Course Code</b>	SIPL-STC-CMM-04

#### 1.6.11.5      Stacker & Reclaimer

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Stacker & Reclaimer, Types, Function & Construction, Safety Devices, Maintenance & Inspection
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-CMM-05

#### 1.6.11.6      Ball Mill

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Types, Function & Construction, Maintenance, Girth Gear - Repairing & Welding Spray Lubrication System, Control & Safety Devices
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1.5 days / 12 hours
<b>Course Code</b>	SIPL-STC-CMM-06

1.6.11.7 Vertical Roller Mill

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Types, Function & Construction, Control & Safety Devices, Maintenance
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-CMM-07

1.6.11.8 Separator

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Types, Function & Construction, Control & Safety Devices, Maintenance
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-CMM-08

### 1.6.11.9 Roller Press

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Principle, Types, Function, Safety Devices, Maintenance
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-CMM-09

### 1.6.11.10 Preheater

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Types, Parts, Control & Safety Devices
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-CMM-10

1.6.11.11 Clinker Cooler

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Types, Function, Construction, Control & Safety Devices, Maintenance
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-CMM-11

1.6.11.12 Pipe Conveyor

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Technical Aspects, Maintenance
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-CMM-12

1.6.11.13 Weigh Bridges

<b>Participants</b>	For service technicians in cement processing industry
<b>Topics</b>	Types, Function, Basic Instrumentation, Sensors, Flow Meters, Weighing Systems
<b>Job Role / Competency</b>	Understand the functioning of plant equipment, equipment safety devices & the commonly encountered problems
<b>Duration</b>	0.5 day / 4 hours
<b>Course Code</b>	SIPL-STC-CMM-13

## 1.6.12 Industrial Painting Basics

### 1.6.12.1 Industrial Painting Safety & Surface Preparation

<b>Participants</b>	For up-skilling of technicians engaged in painting
<b>Topics</b>	Safe Handling of Chemicals, Surface Cleaning, Cleaning Methods, Surface Preparation, Classification, Pre-treatment Defects
<b>Job Role / Competency</b>	Know about safety while handling chemicals & contaminants cleaning, able to prepare the surface for painting & reduce pre-treatment defects
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-PNF-01

### 1.6.12.2 Spray Painting & Powder Coating Process

<b>Participants</b>	For up-skilling of technicians engaged in painting
<b>Topics</b>	Powder Coating Process, Wet Coating Process, Pigment, Binders, Solvents, Additives Spray, Dip, Flow, Roller & Curtain, Spray Guns, Electrostatic & Automatic Spray Guns Paint Spray Techniques, Compressors, Types & Common Problems
<b>Job Role / Competency</b>	Introduced to painting basics & paint compositions, paint storage & application defects, powder coating technique & processes, paint spray technique & processes, understand compressor used in paint shop & common problems
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-PNF-02

### 1.6.12.3 Painting Defects & Quality Control

<b>Participants</b>	For up-skilling of technicians engaged in painting
<b>Topics</b>	Light, Reflection, Refraction, Color & Gloss, Testing of Paint & Painted Surface Viscosity, Film Thickness, Hardness, Adhesion, Salt Spray Test, Paint Defects, Storage Defects, Application Defects, Common Defect, Causes & Cure
<b>Job Role / Competency</b>	Know different methods of paint testing, common paint defects & how to prevent such defects
<b>Duration</b>	2 days / 16 hours
<b>Course Code</b>	SIPL-STC-PNF-03

### 1.6.12.4 Production & Quality Control in Paint Shop

<b>Participants</b>	For up-skilling of technicians engaged in painting
<b>Topics</b>	Quality Control & Use of Analysis Tools, Planning, Cost Analysis, Policies & Procedures, Process Control, Wastages & Feedback
<b>Job Role / Competency</b>	Able to conduct quality control analysis & reporting
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-PNF-04

## 1.6.12.5 Surface Coating Techniques

<b>Participants</b>	For learning specific painting process
<b>Topics</b>	Galvanizing, Thermal, Powder & Dip Coating, Vapor Coating, Electroplating
<b>Job Role / Competency</b>	Know additional coating techniques
<b>Duration</b>	1 day / 8 hours
<b>Course Code</b>	SIPL-STC-PNF-05

### 1.6.13 **Mechatronics**

#### 1.6.13.1 **Electronics for Mechatronics**

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of electronics and basic components of electronics: diodes, transistors, operational amplifiers and digital electronics. It covers the basic operation and some common applications and specific application in mechatronics to monitor and control the machines and mechanics.
<b>Job Role/ Competency</b>	To improve the practical understanding of Electronics for Mechatronics
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

#### 1.6.13.2 **Industrial Automation**

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of control electronics comprising of computers, robots, information technology, data communication, for handling different processes and machineries in an industry.
<b>Job Role/ Competency</b>	To improve the practical understanding of Industrial Automation
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.3 Instrumentation

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of overview of various technologies applied in various field devices used to sense and control different physical parameters of the real-world. This enables aspirants to install and maintain various sensors, transducers and actuators used in process plant automation systems. Understand installation and maintenance of instrumentation in industrial automation.
<b>Job Role/ Competency</b>	To improve the practical understanding of Instrumentation
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.4 Control Systems

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of embedded systems for building devices that can control the physical world. To acquire skills by designing, integrating, and testing microcontroller-based embedded system.
<b>Job Role/ Competency</b>	To improve the practical understanding of Control Systems
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.5 Data Communication

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of Interfaces and communication protocols in industrial networks. Principles of network communication and real-time data acquisition from sensors as inputs and analysis by pre-conceived embedded programs to derive and send appropriate outputs to control actuators across hybrid networks.
<b>Job Role/ Competency</b>	To improve the practical understanding of Data Communication
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.6 Robotics

<b>Participants</b>	for ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the concepts of robot flight and movement, programming of a robot to perform a variety of movements. Understand Robotics and processes to perform critical functions on a 'job' and assisted by human intervention for re-positioning or inspection and similar sub-processes.
<b>Job Role/ Competency</b>	To improve the practical understanding of Robotics
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.7 Power Electronics

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the fundamental of power electronics devices and the basic concepts of switched-mode converter circuits for controlling and converting electrical power with high efficiency. Principles of converter circuit analysis, and steady state voltages, current, and efficiency of power converters.
<b>Job Role/ Competency</b>	To improve the practical understanding of Power Electronics
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.8 Medical Electronics

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the fundamental of medical electronics devices, sensors and instrumentation used in physiological measurement. Developments in electronics technology in the areas of data recording, analysis and image processing. Overview of installation, operation and maintenance of commonly used systems.
<b>Job Role/ Competency</b>	To improve the practical understanding of Medical Electronics
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.9 Automotive Electronics

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the fundamental of electronics in core engineering of passenger vehicles, such as the engine, transmission, brakes, auto control steering, etc. Embedded systems for safety airbags, anti-lock brake, radio, music system, telematics and so on.
<b>Job Role/ Competency</b>	To improve the practical understanding of Automotive Electronics
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.10 Avionics

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of the electronic systems used in aircrafts; Avionic systems include communications, navigation, display and management of multiple systems, and systems to perform individual functions. Learn about FRUs and LRUs; Harnesses, MIL & Aero-Space grade components.
<b>Job Role/ Competency</b>	To improve the practical understanding of Avionics
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.11 Pneumatics & Electro-Pneumatics and Hydraulics

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand fundamentals of pneumatics, air generation & distribution, actuators, valves, systems, application, safety interlocks & controls, troubleshooting & maintenance of pneumatic system. Structure of hydraulic systems, Fluid mechanics and power, mechanical properties and use of liquids, fluid control circuitry. Examples of a hydraulic system.
<b>Job Role/ Competency</b>	To improve the practical understanding of pneumatic systems
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-TI-PNS-01

### 1.6.13.12 Digital Manufacturing

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the computer-aided design, engineering, process planning and manufacturing, product data and life-cycle management, simulation and virtual reality, automation, process control, shop-floor scheduling, decision support system, decision making process, manufacturing resource planning, enterprise resource planning, logistics, supply chain management, and e-commerce systems.
<b>Job Role/ Competency</b>	To improve the practical understanding of Digital Manufacturing
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.13 Additive Manufacturing

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the basic principle of AM and Computer Aided Design (3D CAD) system. Material Science Aspects in Additive Manufacturing: Different materials used in AM. Additive Manufacturing Processes. Modelling in Additive Manufacturing. Applications of Additive Manufacturing.
<b>Job Role/ Competency</b>	To improve the practical understanding of Additive Manufacturing.
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

### 1.6.13.14 Internet-of-Things / Industrial IOT

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the fundamentals of network of physical devices embedded with electronics, software, sensors, actuators, and connectivity which enables these things to connect, collect and exchange data, creating opportunities for more direct integration of the physical world. Understand the application of the IOT, Network of systems, objects, platforms, and applications that can communicate and share intelligence, in near real-time in the manufacturing industry.
<b>Job Role/ Competency</b>	To improve the practical understanding of Internet-of-Things / Industrial IoT
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

<b>Participants</b>	For ITI with at least 3 years' experience and/or Diploma
<b>Topics</b>	Understand the current trend of automation and data exchange in manufacturing technologies including cyber-physical systems, the Internet of things, cloud computing and cognitive computing. Interoperability, Information transparency, Decentralized decision-making.
<b>Job Role/ Competency</b>	To improve the practical understanding of Industry 4.0
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL

## 2 India Courses

(Country-specific courses are aligned with national regulations and standards)



Course participants in India



## 2.1 Sector Skill Council Courses

(These courses are aligned with sector skill council published qualification packs. Participants receive SkillSonics certificate and are qualified to appear for sector skill council certification exam)

### 2.1.1 Capital Goods Skill Council

Capital Goods Sector comprises plant and machinery, equipment / accessories required for manufacture / production, either directly or indirectly, of goods or for rendering services, including those required for replacement, modernization, technological up-gradation and expansion. It also includes packaging machinery and equipment, refrigeration equipment, power generating sets, equipment and instruments for testing, research and development, quality and pollution control.

[http://www.cgsc.in/qualification\\_pack.html](http://www.cgsc.in/qualification_pack.html)



S.No	Sub Sector	Description
1	Machine Tools	Constitutes machines related to metal cutting and forming
2	Power & Electrical equipment	Constitutes machines related to power generation, transmission and distribution
3	Process Plant Machinery	Constitutes machines such as pressure vessels, evaporators, stirrers, heat exchangers etc. used in energy, metallurgy, oil and gas, industry etc.
4	Textile Machinery	Constitutes machines used in various steps of textile fabrication, such as spinning, weaving, processing, testing etc.
5	Plastic, Paper & Rubber Machinery	Constitutes machinery used in various fabrication steps of paper, plastic and rubber manufacturing
6	Light Engineering Goods	Constitutes machines related to roller bearing, process control, instruments, castings, steel forgings, and pipes etc. used in oil & gas, power, automotive etc. industries
7	Earthmoving, Construction and Mining Equipment	Constitutes machines such as graders, dozers, excavators etc. for mining and mixers, tippers, road millers etc. For constructions
8	Material Handling and Lifting Equipment	Constitutes primarily forklifts and cranes
9	Agricultural Machinery	Constitutes machines used in various steps of agriculture, such as land development, sowing, weeding, harvesting etc.

### 2.1.1.1 Fitter Fabrication

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Pass interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0303 Engineering Drawing & Workshop Calculation, Filing, Grinding, Drilling, Threading & Lapping, Measuring & Marking of Components		
<b>Job Role/ Competency</b>	Performs fitting operations on metal components using hand tools and manually operated machines, as per specifications. Achieves NSQF level 3		
<b>Duration for Regular course</b>	4 months for 10th Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC/Q 0303 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Fitter-01 Pack CSC/Q 0303		

### 2.1.1.2 Fitter Mechanical Assembly

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Pass interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0304 Engineering Drawing, Assembly Drawing & Workshop Calculation, Filing, Grinding, Drilling, Threading & Lapping, Measuring & Marking, Component Fitting, Assembly of Equipment & Sub-Assemblies		
<b>Job Role/ Competency</b>	Performs basic machining, fitting and assembly activities of machinery to produce machinery of features as per given specifications. Achieves NSQF level 3		
<b>Duration for Regular course</b>	5 months for 10th Grade Pass 4 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0304 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Fitter-01 Pack CSC/Q 304		

### 2.1.1.3 Sheet Metal Worker – Hand Tools and Manually Operated Machines

<b>Participants</b>	8th Grade Pass interested to become skilled technician		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0301 Engineering Drawing, Fabrication Drawing & Workshop Calculation, Filing, Grinding, Drilling, Threading & Lapping, Measuring & Marking, Sheet Types & properties, Sheet Cutting, Bending, Rolling, Flanging		
<b>Job Role/ Competency</b>	Perform basic sheet metal (up to and including 3 mm) cutting, forming and assembly operations. Capital Goods Manufacturing Industry Achieves NSQF level 2		
<b>Duration for Regular course</b>	3 months	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q0301 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-SMT-01 Pack CSC/Q 0301		

### 2.1.1.4 Fitter Electrical & Electronic Assembly

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Electrical or Electronics pass interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0305 Basics of Electricity, Electrical Components & Electrical Equipment, Mechanical & Electrical drawings, Electrical Fitting - Components Mounting, Panel Wiring - Cabling		
<b>Job Role/ Competency</b>	Operations to assemble and wire up electrical panels/components and equipment and systems to mechanical equipment in Capital Goods Manufacturing Industry Achieves NSQF level 3		
<b>Duration for Regular course</b>	5 months for 10 <sup>th</sup> Grade Pass 4 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q0305 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Elect-01 Pack CSC/Q 0305		

### 2.1.1.5 Operator Conventional Turning

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0110 Engineering Drawing, Assembly Drawing & Workshop Calculation, Bench work, Conventional turning.		
<b>Job Role/ Competency</b>	Produce a range of components that combine different features by carrying out turning operations on different turning machines. Achieves NSQF level 2		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q0110 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Mach-01 Pack CSC/Q 0110		

### 2.1.1.6 Operator Conventional Milling

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0108 Engineering Drawing, Assembly Drawing & Workshop Calculation, Bench work, Conventional turning.		
<b>Job Role/ Competency</b>	Production of a range of components or performing machining by carrying out milling operations on a conventional milling machine Achieves NSQF level 2		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0108 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Mach-01 Pack CSC/Q 0108		

### 2.1.1.7 CNC Operator Turning

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0115		
<b>Job Role/ Competency</b>	Operation of Computer Numerically Controlled (CNC) machines, such as CNC lathe machine, in order to perform turning operations on metal components, as per specifications provided Achieves NSQF level 3		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0115 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-CNC-01 Pack CSC/Q 0115		

### 2.1.1.8 CNC Setter cum Operator Turning

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0120		
<b>Job Role/ Competency</b>	Setting of Computer Numerical Control (CNC) machines, such as CNC lathe machine, in order to perform turning operations on metal components, as per specifications provided. Achieves NSQF level 4		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0120 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-CNC-01 Pack CSC/Q 0120		

### 2.1.1.9 CNC Setter cum Operator Vertical Machining Center

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0123		
<b>Job Role/ Competency</b>	Setting of computers numerically controlled (CNC) vertical machining machines (VMC) in order to perform machining operations on metal components, as per specifications provided. Achieves NSQF level 5		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0123 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-CNC-01 Pack CSC/Q 0123		

### 2.1.1.10 Manual Metal Arc Welder Level 3

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS welder interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0204		
<b>Job Role/ Competency</b>	Perform manual metal arc welding (MMAW) also known as shielded metal arc welding (SMAW) for producing a fillet and groove joints on carbon and low alloy steels in a range of welding positions as per detailed instructions received. Achieves NSQF level 3		
<b>Duration for Regular course</b>	3 months for 10 <sup>th</sup> Grade Pass 2 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0204 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-01 Pack CSC/Q 0204		

### 2.1.1.11 Flux Cored Arc Welder (Semi-Automatic)

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS welder interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0205		
<b>Job Role/ Competency</b>	Perform operations for semiautomatic flux cored arc welding process for a range of standard welding job requirements as per welding procedure specification (WPS). Achieves NSQF level 4		
<b>Duration for Regular course</b>	3 months for 10 <sup>th</sup> Grade Pass 2 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0205 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-01 Pack CSC/Q 0205		

### 2.1.1.12 Senior MMAW/ SMAW Welder

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS welder interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0208		
<b>Job Role/ Competency</b>	Perform manual metal arc welding (MMAW) also known as shielded metal arc welding (SMAW) for producing a range of joints on various forms of materials (carbon steels, low alloy steel and stainless steel as per welding specification procedures (WPS). Achieves NSQF level 4		
<b>Duration for Regular course</b>	3 months for 10 <sup>th</sup> Grade Pass 2 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0208 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-02 Pack CSC/Q 0208		

### 2.1.1.13 MIG or GMAW Welder

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS welder interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0209		
<b>Job Role/ Competency</b>	Perform manual (semi-automatic) operations for performing metal inert gas/metal active gas welding (MIG/MAG) also known as gas metal arc welding (GMAW) for welding joints in all positions as per welding procedure specification (WPS). Achieves NSQF level 4		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0209 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-02 Pack CSC/Q 0209		

### 2.1.1.14 Tungsten Inert Gas Welder (GTAW)

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS welder interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0213		
<b>Job Role/ Competency</b>	Perform manual operations for performing Tungsten Inert Arc Welding (GTAW) also known as Gas Tungsten Arc Welding (GTAW) and independently carry out TIG (GTAW) weld operations for welding joints in all positions as per Welding Procedure Specification Achieves NSQF level 5		
<b>Duration for Regular course</b>	5 months for 10 <sup>th</sup> Grade Pass 4 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0213 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-03 Pack CSC/Q 0213		

### 2.1.1.15 Assistant Manual Arc & Shielded Metal Arc Welder

<b>Participants</b>	5th Grade – 10th Grade Pass interested to become skilled technician		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0202		
<b>Job Role/ Competency</b>	Perform manual metal arc welding (MMAW) also known as shielded metal arc welding (SMAW) for producing groove/ fillet joints on carbon and low alloy steels in simple welding positions as per detailed instructions received. Achieves NSQF level 2		
<b>Duration for Regular course</b>	2 months for 5 <sup>th</sup> Grade Pass and higher 1 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0202 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-02 Pack CSC/Q 0202		

### 2.1.1.16 Tungsten Inert Gas Welder (GTAW) level 4

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS welder interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack CSC/Q 0212		
<b>Job Role/ Competency</b>	Perform basic manual operations for performing Tungsten Inert Arc Welding (GTAW) also known as Gas Tungsten Arc Welding (GTAW) and carry out TIG (GTAW) weld operations for welding various joints in basic positions as per Welding Procedure Specification Achieves NSQF level 4		
<b>Duration for Regular course</b>	3 months for 10 <sup>th</sup> Grade Pass 2 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CSC /Q 0212 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Weld-03 Pack CSC/Q 0212		

2.1.2 Automotive Skills Development Council



The **ASDC** is the sector skill council promoted by the Automobile industry through the following bodies:



### 2.1.2.1 Lathe Operator

<b>Participants</b>	8th Grade Pass interested to become skilled technician		
<b>Topics</b>	As per the approved Qualification Pack ASC/Q 1901		
<b>Job Role/ Competency</b>	Maintain and operate all types of Lathes & do related work Achieves NSQF level 4		
<b>Duration for Regular course</b>	3 months for 8 <sup>th</sup> Grade Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write ASC /Q 1901 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Mach-01 Pack ASC/Q 1901		

### 2.1.2.2 CNC Operator / Machining Technician Level 3

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack ASC/Q 3501		
<b>Job Role/ Competency</b>	Understands the component requirements, machining the part as per work instructions/ standard operating procedures. As CNC Operator selects the required program to machine the parts as per the work instructions, support the machine setter in programming and setting of the tools and conduct process test as per requirement Achieves NSQF level 3		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write ASC /Q 3501 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Mach-01 Pack ASC/Q 3501		

### 2.1.2.3 Machining Technician Level 4

<b>Participants</b>	10th Grade Pass interested to become skilled technician Industrial Training Institute (ITI) CTS Machinist interested to upgrade the skill		
<b>Topics</b>	As per the approved Qualification Pack ASC/Q 3503		
<b>Job Role/ Competency</b>	Understands the component requirements, machining the part as per work instructions/ standard operating procedures. As CNC Operator selects the required program to machine the parts as per the work instructions, support the machine setter in programming and setting of the tools and conduct process test as per requirement Achieves NSQF level 4		
<b>Duration for Regular course</b>	4 months for 10 <sup>th</sup> Grade Pass 3 months for CTS Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write ASC /Q 3503 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-Mach-01 Pack ASC/Q 3503		



2.1.3 Construction Skill Development Council



**Construction Skill  
Development Council of India**

The Construction Skill Development Council of India (CSDCI) aims to establish, standardize and maintain industry competency frameworks, skills levels and occupational standards leading to training outcomes that meet customer requirements.

### 2.1.3.1 Assistant Construction Painter & Decorator

<b>Participants</b>	5th Grade Pass interested to become skilled painter		
<b>Topics</b>	As per the approved Qualification Pack CON/Q 0502 Health, Safety & Environment; Prepare, Handle & Store paint related materials; Surface preparation; Erection & dismantling of scaffolding, platforms, ladders Paint application to required finish; Varnishing & Polishing		
<b>Job Role/ Competency</b>	Identification and preparation of paints and all types of basic surfaces, mixing of colors & paints and their application for obtaining plain finish, erection & dismantling of temporary scaffolding and varnishing and polishing of doors and windows under instructions and close supervision. Achieves NSQF level 2.		
<b>Duration for Regular course</b>	1 month for 5 <sup>th</sup> Grade Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CON /Q 0502 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-APD-01 Pack CON/Q 0502		

### 2.1.3.2 Helper Construction Painter

<b>Participants</b>	5th Grade Pass interested to become skilled painter		
<b>Topics</b>	As per the approved Qualification Pack CON/Q 0501 Health, Safety & Environment; Prepare, Handle & Store paint related materials; Surface preparation; Erection & dismantling of scaffolding, platforms, ladders		
<b>Job Role/ Competency</b>	Identification, selection, handling & storing of tools, tackles & materials, preparation of various paints and surfaces, mixing of colours & paints and erection and dismantling of temporary scaffold and work platforms under instructions and close supervision. Achieves NSQF level 1.		
<b>Duration for Regular course</b>	1 month for 5 <sup>th</sup> Grade Pass	<b>Duration RPL</b>	48 Hours
<b>Certification</b>	Eligible to write CON /Q 501 certification exam by SSC Certificate by Sector Skill Council on passing exam		
<b>Course Code</b>	SIPL-VET-APD-01 Pack CON/Q 0501		

# **3 Trainer and Examiner Courses in India**



### 3.1.1 Training of Trainer – Classroom teaching

<b>Participants</b>	Faculty engaged in teaching in Indian VET school
<b>Topics</b>	Course aligned to NSDC Trainer MEP/Q0102 Qualification Pack. AVIVA (Cooperative teaching), Creating lesson plan and following it, Communication and Presentation techniques, Assessments & Test
<b>Job Role/ Competency</b>	To become qualified trainer to teach NSDC/SSC certified courses
<b>Duration</b>	5 days / 40 hours
<b>Certification</b>	SkillSonicS VET Faculty Optional MEP/Q0102 Trainer certification exam by SSC
<b>Course Code</b>	SIPL-STC-PDG-01

### 3.1.2 Training of Trainer – Workshop training

<b>Participants</b>	Instructors engaged in practical training in Indian VET school
<b>Topics</b>	Course aligned to NSDC Trainer MEP/Q0102 Qualification Pack. IPERCA, Work with curriculum for practical training, Communication and Presentation techniques, Assessments & Tests
<b>Job Role/ Competency</b>	To become qualified trainer to teach NSDC /SSC certified courses
<b>Duration</b>	5 days / 40 hours
<b>Certification</b>	SkillSonicS VET Instructor Optional MEP/Q0102 Trainer certification exam by SSC
<b>Course Code</b>	SIPL-STC-PDG-02

### 3.1.3 Training of Lead Trainer

<b>Participants</b>	Should have been qualified NSDC /SSC trainer
<b>Topics</b>	Course aligned to NSDC Lead Trainer MEP/Q0101 Qualification Pack
<b>Job Role/ Competency</b>	To become qualified Lead Trainer to train the NSDC/ SSC Trainers
<b>Duration</b>	5 days / 40 hours
<b>Certification</b>	SkillSonics VET Master Trainer Optional MEP/Q0101 Lead Trainer certification exam by SSC
<b>Course Code</b>	SIPL-STC-PDG-03

### 3.1.4 Training of Examiner

<b>Participants</b>	Participant aspiring to become certified assessors for Sector Skill Councils. Must hold appropriate qualification and experience in the assessment domain
<b>Topics</b>	Course aligned to NSDC Assessor MEP/Q0104 Qualification Pack. Examination & its purpose, Examiner Mandate, Examining job related skills
<b>Job Role/ Competency</b>	To become qualified Assessor for NSDC/ SSC courses
<b>Duration</b>	5 days / 40 hours
<b>Certification</b>	SkillSonics VET Examiner Optional MEP/Q0104 Assessor certification exam by SSC
<b>Course Catalog</b>	SIPL-STC-PDG-04

### 3.1.5 Training of Master Examiner

<b>Participants</b>	Assessor aspiring to become Lead Assessor Should have been qualified NSDC/ SSC Assessor
<b>Topics</b>	Course aligned to NSDC Lead Assessor MEP/Q0103 Qualification Pack
<b>Job Role/ Competency</b>	To become qualified Assessor Trainer for NSDC/ SSC Assessors
<b>Duration</b>	5 days / 40 hours
<b>Certification</b>	SkillSonics VET Master Examiner Optional MEP/Q0103 Lead Assessor certification exam by SSC
<b>Course Code</b>	SIPL-STC-PDG-05

### 3.1.6 Instructor Training in Fitter & Assembly

<b>Participants</b>	Certified Trainer experienced in Fitter & Assembly Should have completed Trainer course
<b>Topics</b>	Refresher in Fitter & Assembly, Demo on how to conduct practical, Practice by Trainees
<b>Job Role/ Competency</b>	Able to carry out instruction & training in domain specified as per the Sector Skill Qualification packs
<b>Duration</b>	3 days / 24 hours
<b>Certification</b>	SkillSonics VET Instructor – Fitter & Assembly
<b>Course Code</b>	SIPL-STC-PDG-06

### 3.1.7 Instructor Training in Conventional Machining

<b>Participants</b>	Certified Trainer experienced in Conventional Machining Should have completed Trainer course
<b>Topics</b>	Refresher in conventional Turning & Milling, Demo on how to conduct practical, Practice by Trainees
<b>Job Role/ Competency</b>	Able to carry out instruction & training in domain specified as per the Sector Skill Qualification packs
<b>Duration</b>	3 days / 24 hours
<b>Certification</b>	SkillSonic VET Instructor – Conventional Machining
<b>Course Code</b>	SIPL-STC-PDG-07

### 3.1.8 Instructor Training in CNC Machining

<b>Participants</b>	Certified Trainer gaining expertise in CNC Machining Should have completed Trainer course
<b>Topics</b>	Refresher in CNC Machining, Demo on how to conduct practical, Practice by Trainees
<b>Job Role/ Competency</b>	Able to carry out instruction & training in domain specified as per the Sector Skill Qualification packs
<b>Duration</b>	3 days / 24 hours
<b>Certification</b>	SkillSonic VET Instructor – CNC Machining
<b>Course Code</b>	SIPL-STC-PDG-08

### 3.1.9 Instructor Training in Mechatronics

<b>Participants</b>	Certified Trainer gaining expertise in Mechatronics Should have completed Trainer course
<b>Topics</b>	Refresher in Mechatronics, Demo on how to conduct practical, Practice by Trainees
<b>Job Role/ Competency</b>	Able to carry out instruction & training in domain specified as per the Sector Skill Qualification packs
<b>Duration</b>	3 days / 24 hours
<b>Certification</b>	SkillSonics VET Instructor – Mechatronics
<b>Course Code</b>	SIPL-STC-PDG-09

### 3.1.10 Instructor Training in Welding & Fabrication

<b>Participants</b>	Certified Trainer gaining expertise in Welding & Fabrication Should have completed Trainer course
<b>Topics</b>	Refresher in Welding & Fabrication, Demo on how to conduct practical, Practice by Trainees
<b>Job Role/ Competency</b>	Able to carry out instruction & training in domain specified as per the Sector Skill Qualification packs
<b>Duration</b>	3 days / 24 hours
<b>Certification</b>	SkillSonics VET Instructor – Welding & Fabrication
<b>Course Code</b>	SIPL-STC-PDG-10



# 4 Courses for Technical Institutes

(These courses provide practical exposure to diploma or degree program students while they study. Where courses are aligned with sector qualifications, students can obtain additional certification while studying.)



#### 4.1.1 Digital Signal Processing

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the basic concepts of Digital Signal Processing, filter design using the basic concepts of DSP. DSP applications include audio and speech processing, sonar, radar and other sensor array processing, spectral density estimation, statistical signal processing, digital image processing, signal processing for telecommunications, control systems, biomedical engineering and seismology.
<b>Job Role/ Competency</b>	To improve the practical understanding of Digital Signal Processing
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-DSP

#### 4.1.2 Machine Learning

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the principles, algorithms, and applications of machine learning, mathematical and heuristic aspects. understand the concepts and operation of support vector machines, kernel SVM, naïve-bayes, decision tree classifier, random forest classifier, logistic regression, K-nearest neighbors, K-means clustering and more
<b>Job Role/ Competency</b>	To improve the practical understanding of Machine Learning
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-ML

#### 4.1.3 Artificial Neural Networks

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the basic mathematical concepts for understanding nonlinearity and feedback in neural networks, with examples drawn from both neurobiology and computer science. Basic neuron models; Basic neural network models; Basic learning algorithms; Applications: pattern recognition, function approximation, information visualization, etc.
<b>Job Role/ Competency</b>	To improve the practical understanding of Artificial Neural Networks
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-ANN

#### 4.1.4 Image Processing

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the use of computer algorithms to perform image processing on digital images; Visualization: Observe the objects that are not visible normally; Image sharpening and restoration: To create a better image; Image retrieval: Seek for the image of interest; Measurement of pattern: Measures various objects in an image; Image Recognition: Distinguish the objects in an image.
<b>Job Role/ Competency</b>	To improve the practical understanding of Image Processing
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-IMPR

#### 4.1.5 Embedded Systems

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand Advanced C and Coding Standards; C++ and Data Structures; Operating System Essentials (Linux); Computer Architecture and System Design using Micro-controller and SoC; Linux Internals and Systems Programming; Board Support Package (BSP) Development and OS Porting; Kernel Programming and Device Drivers; Hardware Integration and Application Development; Software Engineering module: Product Development Life Cycle; Documentation Standards; Organizational Hierarchy.
<b>Job Role/ Competency</b>	To improve the practical understanding of Embedded Systems
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-EMSY

#### 4.1.6 Artificial Intelligence

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the Linear Models; Dimensionality Reduction; SVM: Develop and implement kernel-based methods to develop nonlinear models to solve few complex tasks; Nearest Neighbors, K-means, and Gaussian Mixture Models; Review pattern recognition ideas with distance and cluster-based models to understand similarity, measures and grouping criteria; Decision Trees; Search: Look at search from the perspective of graphs, trees and heuristic based optimizations; Logic and Planning; Reinforcement Learning and Hidden Markov Models; Q-Learning and Policy gradient.
<b>Job Role/ Competency</b>	To improve the practical understanding of Artificial Intelligence
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-AI

#### 4.1.7 Electronic Design Automation

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the software tools for designing electronic systems such as printed circuit boards and integrated circuits; Silicon realization; SoC realization; System realization: development of a complete hardware-software platform that provides all necessary support for end-user applications.
<b>Job Role/ Competency</b>	To improve the practical understanding of Electronic Design Automation
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-EDA

#### 4.1.8 VLSI Design / HDL

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the Overview of transistor theory and network analysis; Introduction to Linux and scripting; Advanced Logic Design techniques; Concept to Chip design flow; DSM IC Fabrication Flow; Fundamentals of RTL-D and Verification using Verilog; Fundamentals of Static Timing Analysis; Using physical IP in a PD Environment; Domain Specific Topics: Introduction to Full custom Design Flow; Review of foundry documents and IC fabrication steps; Layout design and optimization techniques for DSM process nodes; Layout design of active and passive components; Layout matching and optimization techniques; DFM, DRC/LVS, PEX and Back annotation flows; ESD, LUP and tape-out Flow
<b>Job Role/ Competency</b>	To improve the practical understanding of VLSI Design / HDL
<b>Duration</b>	192 hours spread over one / two semester
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-HDL

#### 4.1.9 Digital Manufacturing

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the computer-aided design, engineering, process planning and manufacturing, product data and life-cycle management, simulation and virtual reality, automation, process control, shop-floor scheduling, decision support system, decision making process, manufacturing resource planning, enterprise resource planning, logistics, supply chain management, and e-commerce systems.
<b>Job Role/ Competency</b>	To improve the practical understanding of Digital Manufacturing
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-DM

#### 4.1.10 Additive Manufacturing

<b>Participants</b>	Students in Electrical, Electronics, Communications, Computer science and allied subjects, pursuing engineering Degree course
<b>Topics</b>	Understand the basic principle of AM and Computer Aided Design (3D CAD) system. Material Science Aspects in Additive Manufacturing: Different materials used in AM. Additive Manufacturing Processes. Modelling in Additive Manufacturing. Applications of Additive Manufacturing.
<b>Job Role/ Competency</b>	To improve the practical understanding of Additive Manufacturing.
<b>Duration</b>	Customized: 40 to 160 hours
<b>Certification</b>	Certificate by SkillSonics
<b>Course Code</b>	SIPL-INST-AM



## 5 Assessment Services



### 5.1.1 Domain Specific Assessment Service

<b>Participants</b>	Organizations interested in evaluating the domain skill level of their workforce
<b>Domains</b>	Conventional Machining, CNC Machining, Mechatronics, Welding & Fabrication. Electrical, Mechanical & Automation. Industrial Safety and Work Skills
<b>Job Role/ Competency</b>	Custom designed domain specific assessment in knowledge and skills at different levels of skills in consultation with the client. Knowledge assessment can also be done on-line.
<b>Duration</b>	As per custom design
<b>Report</b>	Skill Gap analysis



# 6 Courses for Russian speaking countries

(The content for these courses is available in Russian language)

The courses in Russian language have been developed to suit the requirement of the countries with Russian as medium of instruction. The comprehensive material is available for both instructors and course participants. All the materials can be customized and aligned with national regulations and standards.

Курсы на русском языке были разработаны с учетом требований стран, в которых обучение ведется на русском языке. Обширный материал доступен как для инструкторов, так и для участников курсов. Все материалы могут быть адаптированы и приведены в соответствие с национальными нормами и стандартами.



Course participants in Tashkent, Uzbekistan



## 6.1 Courses for Industry

### 6.1.1 Leadership Training (Подготовка руководящих кадров)

<b>Participants</b>	Подходит для всех сотрудников
<b>Topics</b>	<p>Creation and management of a team, communication / presentation skills, motivation and distribution of tasks, change management, the art and science of delegation, decision making, introduction to project management</p> <p>Создание и управление командой, коммуникация / Навыки презентации, мотивация и полномочия, управление изменениями, искусство и наука делегирования, принятие решений, введение в управление проектами</p>
<b>Job Role / Competency</b>	Подходит для всех сотрудников
<b>Duration</b>	5 дней / 40 часов
<b>Course Code</b>	SIAG-LDR-01

### 6.1.2 Industrial painting and pretreatment (Промышленная окраска и предварительная обработка)

<b>Participants</b>	Повышение квалификации
<b>Topics</b>	<p>Chemical safety, cleaning, pretreatment, coating, powder coating and dyeing</p> <p>Химическая безопасность, очистка, предварительная обработка, нанесение покрытия, порошковое покрытие и окраска</p>
<b>Job Role / Competency</b>	Узнайте о безопасности при работе с химикатами и очистителями, научитесь подготавливать поверхность к покраске и уменьшать дефекты предварительной обработки
<b>Duration</b>	2 дня / 16 часов
<b>Course Code</b>	SIAG-VET-TM-IP-01

6.1.3 **Spray Painting & Powder Coating Process (Технология окраски методом распыления)**

<b>Participants</b>	Повышение квалификации
<b>Topics</b>	<p>Powder Coating Process, Wet Coating Process, Pigment, Binders, Solvents, Additives, Spray, Dip, Flow, Roller &amp; Curtain, Spray Guns, Electrostatic &amp; Automatic Spray Guns, Paint Spray Techniques, Compressors, Types &amp; Common Problems</p> <p>Процедура испытаний, химические материалы и краски, абразивные материалы и распылители, механические процессы и компрессоры, анализ дефектов, технология окраски методом распыления, свет и качество</p>
<b>Job Role / Competency</b>	Знакомство с основами и составом краски, дефектами хранения и нанесения краски, техникой и процессами порошкового покрытия, техникой и процессами распыления краски, пониманием того, как использовать компрессор в цехе покраски и общие проблемы
<b>Duration</b>	2 дня/ 16 часов
<b>Course Code</b>	SIAG-VET-TM-IP-02

#### 6.1.4 Welding Technology (Технология сварки)

<b>Participants</b>	Повышение квалификации
<b>Topics</b>	<p>Introduction to welding, ASME &amp; ISO – Codes and Standards, welded joints &amp; joint preparation, WPS &amp; PQR, different types of welding like TIG, MIG, stud and resistance welding, defects in welding and weld cracking, weld distortion and control, quality assurance in welding</p> <p>Введение в сварку, охрана труда и здоровья, ASME и ISO – нормы, правила и стандарты, сварные соединения и подготовка соединения, WPS и PQR, различные типы сварки TIG, MIG - сварка, сварочные дефекты и трещины, обеспечение качества сварки</p>
<b>Job Role / Competency</b>	Слесарь-механик, обычный механик, специалист по сварке и качеству сварки, руководитель производственного цеха
<b>Duration</b>	5 дней / 40 часов
<b>Course Code</b>	SIAG-PP-WT

#### 6.1.5 Sheet Metal Technology (Технология обработки листовых металлов)

<b>Participants</b>	Повышение квалификации
<b>Topics</b>	<p>Transporting &amp; storing semi finished products, cutting, bending, levelling, resources</p> <p>Транспортировка и хранение, резка, гибка, правка, гибка в валках</p>
<b>Job Role / Competency</b>	Слесарь-механик, обычный механик, специалист по обработки листовых металлов, руководитель производственного цеха
<b>Duration</b>	5 дней / 40 часов
<b>Course Code</b>	SIAG-SMT



# 7 Glossary

Abbreviation	Explanation
5S	Kaizen methodology for housekeeping
AC	Alternating Current
ACB	Air Circuit Breaker
ASC	Automotive Skill Council
ASME	American Society of Mechanical Engineers
AVIVA	Swiss acronym for logical learning unit
CBM	Condition Based Maintenance
CGSC	Capital Goods Sector Council
CM1	Code for Instructor Module -1
CM2	Code for Instructor Module -2
CNC	Computerised Numeric Controller
CPU	Central Processing Unit
CT	Current Transformer
CTS	Craftsmen Training Scheme
DC	Direct Current
DCS	Distributed Control System
DG	Diesel Generator
DGA	Type of test for transformer
DOL	Direct On Line
ESP	Electro-Static Precipitator
EX1	Code for Examiner Module -1
EX2	Code for Examiner Module -2
FBD	Flow Block Diagram
G&M codes	Geometric & Machine Codes
GMAW	Gas Metal Arc Welding
GRR	Type of motor starter - Grid rotor resistor
GTAW	Gas Tungsten Arc Welding
HRD	Human Resources and Development
HT	High Tension
IDMT	Inverse Definite Minimum Time
IPERCA	Swiss acronym for practical learning unit
IR	Insulation Resistance
ISO	International Standards Organization
IT8	International Tolerance 8
ITI	Industrial Training Institute
LAD	Ladder Diagram
LOTOTO	Lock out Tag out Test out

LRS	Liquid Resistance starter
LT	Low Tension
LVDT	Linear Variable Distribution Transformer
MAG	Metal Active Gas
MCB	Miniature Circuit Breaker
MCC	Motor Control Center
MCCB	Moulded Case Circuit Breaker
MIG	Metal Inert Gas
MMAW	Manual Metal Arc Welding
MOCB	Minimum Oil Circuit Breaker
MPCB	Motor Protection Circuit Breaker
MSPT	Multi Skilled Production Technician
MT	Code for Master Trainer
NDT	Non Destructive Testing
NSDC	National Skill Development Corporation
NSQF	National Skill Qualification Framework
PCC	Power Control Center
PD	Partial Discharge
PGNAA	Type of sensor
PI controller	Proportional Integral controller
PID controller	Proportional Integral derivative controller
PLC	Programmable Logic Controller
PSU	Power Supply Unit
PT	Potential Transformer
PV	Photo Voltaic
RPL	Recognition of Prior Learning
QP	Qualification Pack
SF6	Type of circuit breaker
SFIVET	Swiss Federal Institute for Vocational Education and Training
SM1	Code for Domain Specialization Module -1
SM2	Code for Domain Specialization Module -2
SM3	Code for Domain Specialization Module -3
SM4	Code for Domain Specialization Module -4
SMAW	Submerged Metal Arc Welding
SSC	Sector Skill Council
STL	Statement List
SWISSMEM	Association of Swiss Mechanical and Electrical Industries
TAN Delta	Type of transformer test
TIG	Tungsten Inert Gas
ToT	Training of Trainer
UPS	Uninterrupted Power System
VCB	Vacuum Circuit Breaker
VET	Vocational Education and Training

VFD	Variable Frequency Drive
VT1	Code for VET Manager Training Module -1
VT2	Code for VET Manager Training Module -2
WPS	Welding Procedure Specification
XRD	Xray diffraction sensor
XRF	Xray Fluorescence sensor



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