



Bharatiya Vidya Bhavan's
Sardar Patel College of Engineering

(Govt. Aided Autonomous Institute Affiliated to University of Mumbai)
Munshi Nagar, Bhavan's Campus, Andheri (W), Mumbai 400058.



Date: 18th January 2021

**Certification Programs in association with
Tata Power Skills Development Institute (TPSDI)**

The Training & Placement Office is signing a MoU with **Tata Power Skill Development Institute (TPSDI)** under TEQIP-III Project. As a part of this MoU T & P Office will be offering following **Certification Programs** in association with TPSDI:

Sr. No.	Course Title	Duration	Eligible Branches
1.	Certified Electrical Engineering Professional a) Fundamental Industrial Electrical Skills b) Power System Overview c) Best O & M Practices for Motors and Transformers d) Switchgear Installation, O & M and testing	60 hrs 15 hrs (each module)	Electrical Engineering
2.	Certified Solar PV Professional a) Solar PV fundamentals b) Solar PV Systems, Off-grid, on-grid and hybrid systems c) Solar PV Design and Installation d) Solar PV O & M and Commissioning	60 hrs 15 hrs (each module)	Electrical Engineering
3.	Certified Mechanical Engineering Professional a) Fundamental Industrial Mechanical Skills b) Industrial Valves and Pump maintenance Skills c) Mechanical Drives Maintenance Skills d) Industrial Mechanical Maintenance Skills	60 hrs 15 hrs (each module)	Mechanical Engineering

All the courses will be conducted **online** by TPSDI experts. The courses for Civil Engineering students will be developed by TPSDI in due course of time.

There are 4 modules of 15 hrs duration each, in all the Certification Programs. TPSDI will offer a certificate to the students who complete each module and the assessment successfully. Students will have an option to complete a few or all the four modules in each Certification Program. After completion of all the 4 modules, a certification of **Certified Professional** will be offered. The detailed contents of each certification program are attached with this notice.

The interested students need to register at following link for the **first module** of these Certification Programs: <https://forms.gle/BWDASPXrqXrTSWzx7>

The **first module** of following two Certification Programs will be conducted as per the following schedule:

Sr. No.	Module	Dates and Timing	Focused Group
1.	Solar PV Fundamentals	23, 24, 26 Jan 2021 (3-days) 10.00 am to 1.00 pm and 2.00 pm to 4.00 pm (5 hrs each day)	SY, TY and Final Year B Tech Electrical
2.	Fundamental Industrial Mechanical Skills		SY, TY and Final Year B Tech Mechanical

All the further sessions of remaining modules in each Certification Program will also be conducted either on weekend, public holidays or after college timings on weekdays. Only the students who can attend the classes as per this schedule are advised to register for the Certification Programs.

For any queries students can write to tpo@spce.ac.in



Dr. Rahul T. Dahatonde

T & P Officer

Encl: Brochures of each Certification Program



TVAS Certified Solar PV Professional



Course Objective:

This professional certification comprises 5 course that enable students to understand the fundamentals of solar, installation, commissioning and maintenance and gives them an understanding of the troubleshooting issues in a solar PV system. Students are also acquainted with the principles of selecting sites for solar installation and designing a solar plant. Students get to carry out Installation, Operation & Commissioning of Stand Alone/ Off-grid and Solar PV Grid System at a TPSDI hub and gain hands-on skills.

Target Group

- B. Tech.students
- Diploma students
- Science Graduates

Training Delivery Mode



Instructor led
virtual classroom
session with video
demonstrations



Hands-on Training
at TPSDI hub

Course Outcome

This intensive training course has been specifically designed for professionals and engineering/science students who aspire to build a career in India's booming solar industry

- ✓ Acquire in-depth knowledge and skills in Solar Power Generation
- ✓ Acquire hands-on skills needed to become entrepreneurs / self-employed.

Course Duration

- ✓ 5 hours x 6 days x 4 weeks – instructor led virtual classroom session with video demonstrations
- ✓ 7 hours x 4 days – Training on Installation, Commissioning and maintenance of Solar PV System at TPSDI hub



Course Outline



4511 Solar PV Fundamentals

Learning Outcomes: This is your first step in becoming a professional ready for the solar industry. The course will develop a strong foundation in the fundamentals of solar energy and solar photovoltaic (PV) systems. You will develop a good understanding of solar PV modules and all their components such as cables, connectors, mounting structures, invertors etc. You will develop a sound understanding of the working principles of solar panels and will be acquainted with tools, instruments, personal protective equipment used in installing, maintaining and operating solar PV power plants. You will also understand the wide-ranging applications of solar.

4512 Solar PV Systems-Off Grid, On Grid & Hybrid

Learning Outcomes: Building on the strong foundation of Solar PV Fundamentals, this course gives you an in-depth understanding of the primary solar PV power systems - Off Grid, On Grid and Hybrid systems. The course will enable you to understand the conditions and locations in which each of these can be installed and the advantages and disadvantages of each of the systems. This course also seeds in you the concepts and principles that inform the design of a solar power plant.

4513 Solar PV Design and Installation

Learning Outcomes: After understanding the different configurations of solar PV systems, this course introduces you to designing solar PV plants. You will understand how to choose the best site for optimum solar power generation, and you will get an idea of how solar plants are designed and configured after a site is selected. The focus of the course is on building your knowledge of installing solar PV plants and will take you step-by-step through the installation process. Covering, right from erecting mounting structures and clamping the solar panels to connecting the solar panels to a distribution system and synchronising the inverters this course will make you confident and daring to try your hands at installing a solar PV plant. You will also understand how to design a battery system and then connect batteries to solar PV panels and carry out earthing for electrical protection.

4514 Solar PV Operation, Maintenance Commissioning

Learning Outcomes: Installing a Solar PV plant, is only half the job done. Solar PV plants can be in service for 25-30 years, provided they are operated and maintained well. This course takes you to the next steps after solar PV system installation and shows you how to commission a system. After commissioning, the plant needs to be monitored to ensure it is providing the output for which it was designed. This course will take you through operational parameters and will also enable you to understand the maintenance activities that are needed to ensure the PV plant operates at its optimum. You will understand how to work with cutting-edge instruments such as a solar PV Analyser and get an idea of how to troubleshoot the PV system if something goes wrong.

4515 Solar PV Professional Advantage Course

Learning Outcomes: To be a complete professional it is very necessary to work with all the instruments, tools and equipment needed to identify the best site for a PV plant and then install, operate and maintain a solar plant. This intensive 4-day practical training course at a TPSDI hub is the capstone of all that you've learned in the earlier 4 courses and enables to put it all into practice. You will identify a site, install a solar PV system, connect it to a grid, synchronise it, operate it, maintain it and even troubleshoot various issues. You will get to use all the tools and equipment and try out various solar PV working conditions and parameters on state-of-the-art solar PV simulators in a safe and supportive environment. This is the course that transforms your knowledge into employable industry skills. This is the course that will give you the confidence that you are a complete professional who is now ready for the solar industry.

- ✓ The first four courses will be Instructor-Led virtual classroom sessions using power point presentations, video clips, working examples and exercises. Each course would be of 15 hours duration. Final assessment will be conducted on the last day of each course followed by Certification of individual courses by Tata Power's TVAS upon successful completion. The assessment will be carried out online.
- ✓ The fifth course would provide participants hands-on experience on equipment, accessories, tools and personal protective equipment at a TPSDI hub. The participants will carry out Erection, Testing & Commissioning of Stand Alone / Off-grid & Solar PV Grid System under expert guidance at a TPSDI training centre during this course. Course duration is 4 days x 7 hours at (TPSDI hub). Upon successfully completing the course, a TVAS Certified Solar PV Professional certificate will be given under TPSDI Virtual Academy of Skills.

Course Snapshot

Course	Duration	Training Methodology	Prerequisite
TVAS – Solar PV Fundamentals	3 days x 5 hours	Theory, Demonstrations, and Assessments Through Instructor-led Classroom Sessions Virtual	Educational Qualifications as Prescribed
TVAS – Solar PV Systems - Off-Grid, On-Grid, and Hybrid systems	3 days x 5 hours		TVAS – Solar PV Fundamentals Certificate
TVAS – Solar PV Design and Installation	3 days x 5 hours		TVAS – Solar PV Systems - Off-Grid, On-Grid, and Hybrid systems Certificate
TVAS – Solar PV Operation, Maintenance, and Commissioning	3 days x 5 hours		TVAS – Solar PV Design and Installation Certificate

For any queries, contact SPCE T & P Office at tpo@spce.ac.in



Training & Placement Office
Jointly organize under TEQIP-III

TVAS Certified Mechanical Skills

Target Group

B.E/B. Tech. Mechanical Engg. Students

Mech. Diploma Students

Training Mode

Modular Courses

Instructor-led Virtual Classroom with Videos and Live Demonstrations

Virtual Workshops with Live Maintenance Demonstrations

Hands-on Skills Training at a TPSDI Hub

PROGRAM OBJECTIVE

This professional skills certification comprises five courses that groom students in common mechanical maintenance practices across industries. Students are acquainted with various hand and power tools widely used across industries. They acquire in-depth knowledge, from industry experts, of the maintenance activities of commonly use industrial equipment. Along with these knowledge and skills, students are given a thorough grounding in industrial safety practices. Students also come to a TPSDI hub and gain hands-on skills in using various tools and in performing maintenance activities on industrial equipment such as valves, pumps, mechanical drives, bearings, and others. This program will make a mechanical engineer ready for the industry.

Program Outcomes

This training program has been specifically designed for professionals and engineering students who aspire to build a career in India's growing industrial sectors. The TVAS Certified Mechanical Skills Program will enable you to acquire

- ✓ in-depth knowledge and skills in commonly used mechanical tools used widely across different industries.
- ✓ comprehensive understanding of common maintenance practices across industries.
- ✓ knowledge of maintenance activities of commonly used industrial equipment.
- ✓ thorough grounding in industrial safety practices.
- ✓ hands-on skills in performing maintenance activities on industrial equipment such as valves, pumps, mechanical drives, bearings, and others.

Program Outline

5366: TVAS – Fundamental Industrial Mechanical Skills

Learning Outcomes: This is your first step in becoming a mechanical engineer ready for the industry. This course will develop a strong foundation in the fundamentals skills demanded by the industry from a mechanical engineer – the knowledge and ability to use various tools in mechanical activities. You will develop a good understanding of the commonly used hand tools as well as power tools. You will also understand how to use measuring tools to take accurate measurements – a critical skill required by a mechanical engineer. Apart from understanding various tools and how they are used in the industry, you will also be given a thorough grounding in basic industrial safety practices.

5367: TVAS – Industrial Valves and Pumps Maintenance Skills

Learning Outcomes: Building on the strong foundation of Fundamental Industrial Mechanical Skills, this course gives you an in-depth understanding of the key components of valves and pumps, the most commonly used mechanical equipment in any industry. This course will familiarise you with the different types of commonly used industrial valves. You will also understand how to operate pumps safely and acquaint yourselves with some unsafe operating procedures of pumps that are likely to damage the equipment. You will develop an understanding of the skills needed to maintain valves and pumps along with their associated pipe fittings. The course will also cover crucial procedure in mechanical maintenance activities — the application of engineer's blue and blue matching. Continuing the emphasis on safe working, the course will familiarise you with confined space safety procedures.

5368: TVAS – Mechanical Drives Maintenance Skills

Learning Outcomes: A very important component in a mechanical engineer's stock of skills is the capability to carry out maintenance of mechanical drives. The focus of this course is on building your knowledge of identifying and maintaining mechanical drives such as belt drive, chain drive, and gear drive. You will also develop a good understanding of different types of couplings and learn to identify different types of bearings and their maintenance procedures. This course will introduce you to a crucial maintenance procedure — analysis of shaft health using shaft run out procedure. Apart from building your knowledge and skills of mechanical drives and their maintenance, this course will also prepare you to work safely in any industrial sector by imparting crucial fire safety skills.

5369: TVAS – Industrial Mechanical Maintenance Skills

Learning Outcomes: After picking up the fundamental knowledge and skills of using various tools and basic maintenance procedures of valves and pumps and of mechanical drives, this course will deepen your understanding of critical industrial mechanical maintenance knowledge and skills. Apart from common practices in industrial maintenance activities, you will learn general welding procedures and understand how to analyse welding joints using non-destructive testing (NDT) procedures such as radiographic film inspection and dye penetrant (DP) inspection tests. This course will also introduce you to the maintenance of plate type heat exchanger and you will learn alignment skills by carrying out pump and motor alignment using dial gauges. Condition monitoring is a critical component of industrial maintenance and this course lays a strong foundation for you in this area by covering its fundamentals. This course also builds your industrial safety skills by developing your knowledge of industrial safety working procedures.

5370: TVAS – Industrial Mechanical Skills Professional Advantage

Learning Outcomes: To be an industry-ready professional it is very necessary to work with all the instruments, tools and equipment, and practise various maintenance procedures of valves, pumps, mechanical drives, welding joint analysis and others. This intensive 4-day practical training course at a TPSDI hub is the capstone of all that you have learned in the earlier four courses and enables to put it all into practice. You will get to use various tools and equipment and acquire hands-on skills on maintaining commonly used industrial mechanical equipment like valves, pumps, pipe fittings, mechanical drives. At the TPSDI hub you will analyse shaft health using shaft run out procedure and you will also analyse welding joints using non-destructive testing and carry out pump and motor alignment. You will also get to see the implementation of crucial safety procedures closely. This is the course that transforms your knowledge into employable industry-needed mechanical skills. This is the course that will give you the confidence that you are more than a mechanical engineer, you are a complete professional who is now ready for the industry.

Training Methodology and TVAS Certification

- ✓ The first four courses will be instructor-led virtual classroom and workshop sessions using power point presentations, video clips, live demonstrations, working examples, and exercises. Each course will be of 15 hours duration. Final assessment will be conducted on the last day of each course followed by certification of individual courses by Tata Power's TVAS upon successful completion. The assessment will be carried out online.
- ✓ The fifth course will provide participants hands-on experience on tools, equipment, instruments, and personal protective equipment at a TPSDI hub. The participants will carry out maintenance procedures on industrial mechanical equipment like valves, pumps, pipe fittings, mechanical drives, analyse welding joints using non-destructive testing, and carry out pump and motor alignment. The course duration is 4 days x 7 hours at TPSDI-Vidyavihar. After successfully completing the course, a TVAS Certified Mechanical Skills Professional certificate will be awarded under the TPSDI Virtual Academy of Skills.

Program Snapshot

Course	Duration	Training Methodology	Prerequisite
TVAS – Fundamental Industrial Mechanical Skills	3 days x 5 hours	Theory, Demonstrations, and Assessments Through Instructor-led Virtual Classroom Sessions	Educational Qualifications as Prescribed
TVAS – Industrial Valves and Pumps Maintenance Skills	3 days x 5 hours		TVAS – Fundamental Industrial Mechanical Skills Certificate
TVAS – Mechanical Drives Maintenance Skills	3 days x 5 hours		TVAS – Industrial Valves and Pumps Maintenance Skills Certificate
TVAS – Industrial Mechanical Maintenance Skills	3 days x 5 hours		TVAS – Mechanical Drives Maintenance Skills Certificate

For any queries contact SPCE, T & P Office at tpo@spce.ac.in



**Training & Placement Office
Jointly Organize under TEQIP-III**



TVAS Certified Electrical Skills Professional

Target Group

- Graduate Engineering Students
 - Electrical
- Diploma Engineering Students
 - Electrical

Training Mode

- Modular Courses
- Instructor-led Virtual Classroom with Video Demonstrations
- Hands-on Skills Training at a TPDSI Hub
-

PROGRAM OBJECTIVE

This professional skills certification comprises five courses that train students in essential electrical skills and practices across industries and a variety of critical electrical equipment. Students develop a strong foundation in the fundamentals of electricity, configuration of various circuits and understand the importance of earthing. They acquire a broad understanding of the power system and the function of the various components and equipment that make up a power system. Students also develop a strong base in the installation, operation and maintenance of critical electrical equipment – motors, transformers, and switchgear. Along with these knowledge and skills, students are given in-depth understanding in electrical safety practices. Students also come to a TPDSI hub and gain hands-on skills in using various tools and in performing installation, testing, and Operation and Maintenance (O&M) activities on electrical equipment. This comprehensive program, that building knowledge and skills in power system and critical electrical equipment, will make an electrical engineer ready for the industry.



Program Outline

WEEK 1: TVAS – Fundamental Industrial Electrical Skills

Learning Outcomes

This is your first step in becoming an electrical engineer ready for the industry. This course will develop a strong foundation in the fundamental knowledge and skills demanded by the industry from an electrical engineer – a strong understanding of the central concepts and principles of electricity such as current, voltage, power and energy and interpret their impact on AC and DC circuits. You will develop a good understanding of the application and configuration of single-phase and three-phase circuits. You will also understand the impact of active and reactive power on the power system. You will understand the criticality of equipment earthing for safety. You will also be introduced to the common tools used in industry and their inspection and upkeep. You will also be given a thorough grounding in identifying unsafe acts and conditions to ensure safe work practices in industry.

WEEK 2: TVAS– Power System Overview

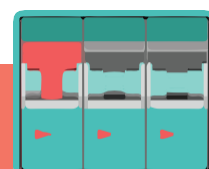
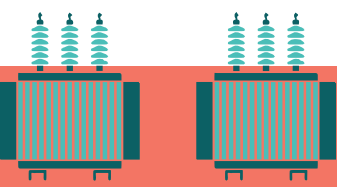
Learning Outcomes

Building on the strong foundation of Fundamental Industrial Electrical Skills, this course gives you an in-depth understanding of the power system. You will be introduced to key components and function of equipment such as boilers, turbines, generators, and exciters in generating electricity. This course will familiarise you with transmission line towers, insulators, conductors, cables and accessories for transmission of power. You will also understand the working principles of transformers, circuit breakers, Isolators, Ring Main Unit (RMU), Current Transformer (CT), Potential Transformer (PT), and Lightning Arrestor (LA) for Primary and Secondary distribution system. You will develop sound knowledge of the application of protective devices such as fuse, Miniature Circuit Breaker (MCB), Residual Current Circuit Breaker (RCCB) and Earth-leakage Circuit Breaker (ELCB) on Low Voltage (LV) circuits. You will develop an understanding of various electrical measuring instruments and interpret values such as insulation resistance.

WEEK 3: TVAS – Best O&M Practices for Motors & Transformers

Learning Outcomes

A very important component in an electrical engineer's stock of skills is the capability to carry out operation and maintenance of key electrical equipment – motors and transformers. This course will build your knowledge of features and selection criteria for various types of AC and DC motors and working and application of different types of motors. You will also be introduced to connection, testing, and commissioning of single-phase and three-phase motors and DC motors. You will understand how to troubleshoot and repair faults in motors and carry out the installation and connection of a motor generator set. You will also develop a good understanding of the operation and maintenance of transformers, their testing, and trouble shooting. This course will also introduce you to installation, testing, and commissioning of single-phase and three-phase energy meters and the process of verification of energy consumption through energy calculations.



WEEK 4: TVAS – Switchgear Installation, O&M, and Testing

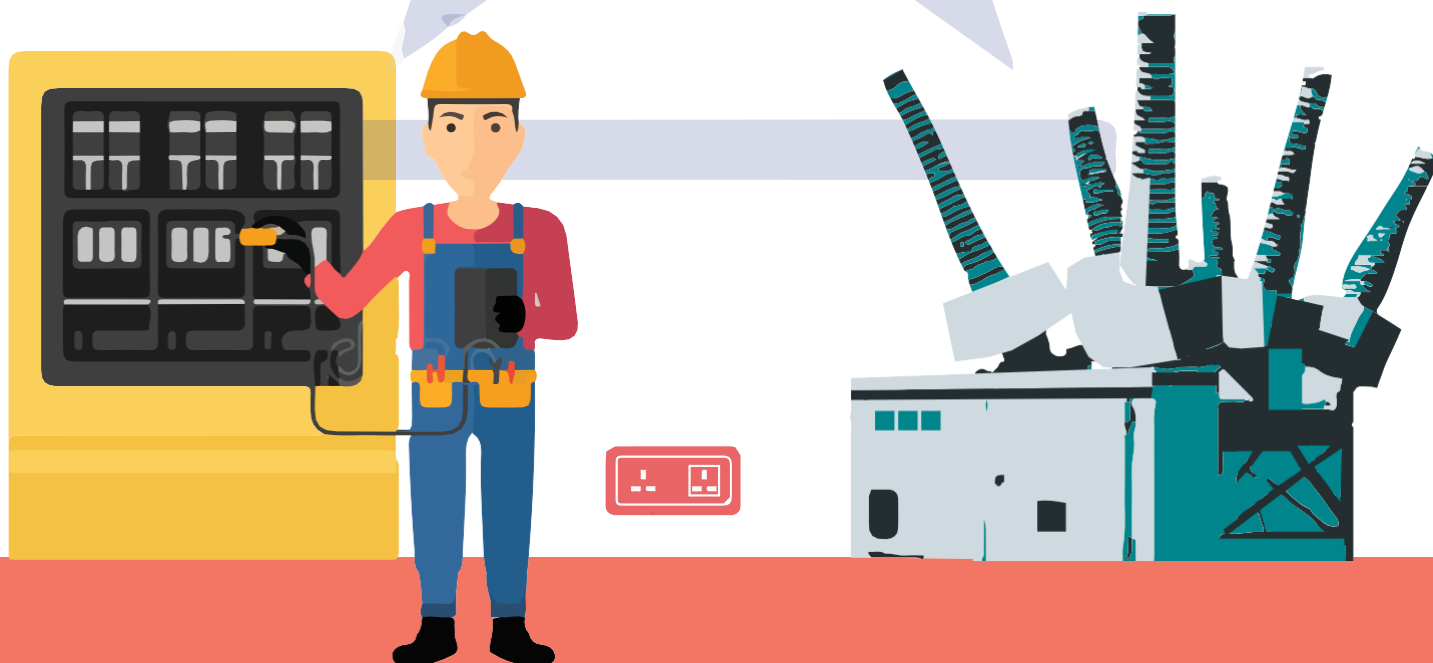
Learning Outcomes

After picking up the knowledge and skills of O&M practices for motors and transformers, this course will develop your understanding and skills in installation, O&M, and testing of switchgear. Starting with the basics, you will develop good knowledge of the design aspects and selection criteria of Switchgear. You will be familiarized with switchgear equipment and different types of circuit breakers. You will be acquainted with the practices to install, operate, maintain, and test switchgear. You will be introduced to Gas Insulated Substations (GIS) and Hybrid Substations and their application in a power utility. You will also understand how to carry out tests such as CT ratio, polarity, and insulation test. You will also acquire knowledge to identify electrical hazards, take control measures, and use safe electrical practices while working on switchgear.

WEEK 5: TVAS – Industrial Electrical Skills Professional Advantage Course

Learning Outcomes

To be an industry-ready professional it is very necessary to work with all the instruments, tools and equipment, and practise various operation and maintenance, and installation and testing procedures of motors, transformers, energy meters and switchgear. This intensive 4-day practical training course at a TPSDI hub is the capstone of all that you've learned in the earlier four courses and enables you to put it all into practice. You will get to use all the tools and equipment and acquire hands-on skills on critical electrical equipment. You will get to try your hands on some key power system equipment and carry out operation and maintenance of key electrical equipment – motors and transformers. At the TPSDI hub you will also get to work with switchgear equipment and different types of circuit breakers. You will also get to see the implementation of crucial safety procedures closely. This is the course that transforms your knowledge into employable industry-needed electrical skills. This is the course that will give you the confidence that you are more than an electrical engineer, you are a complete professional who is now ready for the industry.



The first four courses will be instructor-led virtual classroom sessions using power point presentations, video clips, live demonstrations, working examples, and exercises. Each course will be of 15 hours duration. A final online assessment will be conducted on the last day of each course followed by certification of individual courses by Tata Power's TVAS upon successful completion.

The fifth course will provide participants hands-on experience on tools, equipment, instruments, and personal protective equipment at a TPSDI hub. The participants will carry out operation and maintenance of key electrical equipment – motors and transformers and get to work with switchgear and different types of circuit breakers. The course duration is 4 days x 7 hours at TPSDI-Shahad. After successfully completing the course, a TVAS Certified Electrical Skills Professional certificate will be awarded under the TPSDI Virtual Academy of Skills.

Course Snapshot

Course	Duration	Training Methodology	Prerequisite
TVAS – Fundamental Industrial Electrical Skills	3 days x 5 hours	Theory, Demonstrations, and Assessments Through Instructor-led Virtual Classroom Sessions	Educational Qualifications as Prescribed
TVAS – Power System Overview	3 days x 5 hours		TVAS – Fundamental Industrial Electrical Skills Certificate
TVAS – Best O&M Practices for Motors and Transformers	3 days x 5 hours		TVAS – Power System Overview Certificate
TVAS – Switchgear Installation, O&M, and Testing	3 days x 5 hours		TVAS – Best O&M Practices for Motors and Transformers Certificate