Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skills for All"

Course Contents/ Lesson Plan

Course Title: UPS & Solar PV Technician
Duration: 6 Months

Course Details / Description & Preliminaries

Course Title	UPS & Solar PV Technician
Objectives and Expectations	**Employable skills through an intensive course on UPS & Solar PV Technician** This is a special course designed to address unemployment in the youth. The course aims to achieve the above objective through hands on practical training delivery by a team of dedicated professionals having rich market/work experience. This course is therefore not just for developing a theoretical understanding/back ground of the trainees. Contrary to that it is primarily aimed at equipping the trainees to perform commercially in a market space in independent capacity or as a member of a team. The course therefore is designed to impart not only technical skills but also soft skills (i.e. interpersonal/communication skills; personal grooming of the trainees etc.) as well as entrepreneurial skills (i.e. marketing skills; free lancing etc.). The course also seeks to inculcate work ethics to foster better citizenship in general and improve the image of Pakistani work force in particular. **Main Expectations:** In short, the course under reference should be delivered by professional instructors in such a robust hands- on manner that the trainees are comfortably able to employ their skills for earning money (through wage/self-employment) at its conclusion. This course thus clearly goes beyond the domain of the traditional training practices in vogue and underscores an expectation that a market centric approach will be adopted as the main driving force while delivering it. The instructors should therefore be experienced enough to be able to identify the training needs for the possible market roles

	available out there. Moreover, they should also know the strengths and weaknesses of each individual trainee to prepare them for such market roles during/after the training.
Key Features of Training& Special Modules	**i.** Specially designed practical tasks to be performed by the trainees have been included in the Annexure-I to this document. The record of all tasks performed individually or in groups must be preserved by the management of the training Institute clearly labeling name, trade, session etc so that these are ready to be physically inspected/verified through monitoring visits from time to time. The weekly distribution of tasks has also been indicated in the weekly lesson plan given in this document. **ii.** In order to materialize the main expectations, a special module on **Job Search & Entrepreneurial Skills** has been included in the later part of this course (5^{th} & 6^{th} month) through which, the trainees will be made aware of the Job search techniques in the local as well as international job markets (Gulf countries). Awareness around the visa process and immigration laws of the most favored labor destination countries also forms a part of this module. Moreover, the trainees would also be encouraged to venture into self-employment and exposed to the main requirements in this regard. It is also expected that a sense of civic duties/roles and responsibilities will also be inculcated in the trainees to make them responsible citizens of the country. **iii.** A module on **Work Place Ethics** has also been included to highlight the importance of good and positive behavior at work place in the line with the best practices elsewhere in the world. An outline of such qualities has been given in the

	Appendix to this document. Its importance should be conveyed in a format that is attractive and interesting for the trainees such as through PPT slides +short video documentaries. Needless to say that if the training provider puts his heart and soul into these otherwise non-technical components, the image of Pakistani workforce would undergo a positive transformation in the local as well as international job markets. In order to maintain interest and motivation of the trainees throughout the course, modern techniques such as: • motivational lectures • success stories • case studies These techniques would be employed as an additional training tool wherever possible (these are explained in the subsequent section on Training Methodology). Lastly, evaluation of the competencies acquired by the trainees will be done objectively at various stages of the training and proper record of the same will be maintained. Suffice to say that for such evaluations, practical tasks would be designed by the training providers to gauge the problem solving abilities of the trainees.
Training Tools/ Methodology	**(i) Motivational Lectures** The proposed methodology for the training under reference employs motivation as a tool. Hence besides the purely technical content, a trainer is required to include elements of motivation in his/her lecture to inspire the trainees to utilize the training opportunity to the full and strive towards professional excellence. Motivational lectures may also include general topics such as the importance of moral values and civic

role & responsibilities as a Pakistani. A motivational lecture should be delivered with enough zeal to produce a deep impact on the trainees. It may comprise of the following:

- Clear Purpose to convey message to trainees effectively.
- Personal Story to quote as an example to follow.
- Trainees fit so that the situation is actionable by trainees and not represent a just idealism.
- Ending Points to persuade the trainees on changing themselves.

A good motivational lecture should help drive creativity, curiosity and spark the desire needed for trainees to want to learn more.

Impact of a successful motivational strategy is amongst others commonly visible in increased class participation ratios. It increases the trainees' willingness to be engaged on the practical tasks for longer time without boredom and loss of interest because they can clearly see in their mind's eye where their hard work would take them in short (1-3 years); medium (3 -10 years) and long term (more than 10 years).

As this tool is expected that the training providers would make arrangements for regular well planned motivational lectures as part of a coordinated strategy interspersed throughout the training period as suggested in the weekly lesson plans in this document.

(ii) Success Stories

Another effective way of motivating the trainees is by means of Success Stories. Its inclusion in the weekly lesson plan at regular intervals has been recommended till the end of the training.

A success story may be disseminated orally, through a presentation or by means of a video/documentary of someone that has risen to fortune, acclaim, or brilliant achievement. A success story shows how a person achieved his goal through hard work, dedication and devotion. An

	inspiring success story contains compelling and significant facts articulated clearly and easily comprehendible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. Optimum impact is created when the story is revealed in the form of:- • Directly in person (At least 2-3 cases must be arranged by the training institute) • Through an audio/ videotaped message (2-3 high quality videos must be arranged by the training institute) It is expected that the training provider would collect relevant high quality success stories for inclusion in the training as suggested in the weekly lesson plan given in this document. Suggestive structure and sequence of a sample success story and its various shapes can be seen at annexure III. **(iii) Case Studies** Where a situation allows, case studies can also be presented to the trainees to widen their understanding of the real life specific problem/situation and to explore the solutions. In simple terms, the case study method of teaching uses a real life case example/a typical case to demonstrate a phenomenon in action and explain theoretical as well as practical aspects of the knowledge related to the same. It is an effective way to help the trainees comprehend in depth both the theoretical and practical aspects of the complex phenomenon in depth with ease. Case teaching can also stimulate the trainees to participate in discussions and thereby boost their confidence. It also makes class room atmosphere interesting thus maintaining the trainee interest in training till the end of the course. Depending on suitability to the trade, the weekly lesson plan in this document may suggest case studies to be presented to the trainees. The trainer may adopt a power point presentation or video format for such case studies whichever is deemed suitable but it's important that

	only those cases are selected that are relevant and of a learning value. The Trainees should be required and supervised to carefully analyze the cases. For the purpose they must be encouraged to inquire and collect specific information / data, actively participate in the discussions and intended solutions of the problem / situation. **Case studies can be implemented in the following ways:-** i. A good quality trade specific documentary(At least 2-3 documentaries must be arranged by the training institute) ii. Health & Safety case studies(2 cases regarding safety and industrial accidents must be arranged by the training institute) iii. Field visits(At least one visit to a trade specific major industry/ site must be arranged by the training institute)
Learning Outcome of the Course	By the end of the course the trainees will be able to have following competencies and skills. • Practice safe working methods on electrical systems. • Understand the relevant regulative requirements. • Demonstrate an understanding of electrical principles and units. • Understand the different static UPS topologies • Comprehend the importance of continuous power supply for critical and sensitive loads during power outages • Analyze the characteristics of batteries • Understand the operations and construction of the dynamic UPS or the diesel rotary UPS • Appreciate the merits of battery monitoring systems and power quality • Conduct site assessment for Solar PV system installation • Develop basic solar PV system design • Interpret job document

	• Install Solar PV System • Perform Solar PV System Wiring • Troubleshoot Solar PV System • Maintain Solar PV system • Perform Safety measure during electric work • Develop basic Entrepreneurial skills • Diagnose basic faults and recognize their associated symptoms • Use circuit diagrams as an aid to maintenance. • Read out and practically know the electrical drawing and symbols. • Access electrical enclosures and replace fuses, reset overloads etc.
Course Execution Plan	Total Duration of Course: 6 Months (26 Weeks)
	Class Hours: 4 Hours per day (06 Days/Week)
	Theory: 20% Practical: 80%
	Weekly Hours: 24 Hours Per week
	Total Contact Hours: 600 Hours
Companies Offering Jobs in the respective trade	The following public and private companies can offer jobs in the trade:- Pakistan Atomic energy commission (PAEC), Pakistan Ordnance factories (POFs), WAPDA, OGDCL, Construction companies, Oil mills, flour mills, Petrol & CNG stations etc.
Job Opportunities	The passed out can work as:- • UPS/Solar PV Technicianin industry (Textile, Leather, Pharmaceuticals, Food Processing, Automotive, Cement etc.) • UPS/Solar PV supervisor in relevant industries. • Self-employmentfor livelihood/income.
No of Students	25
Learning Place	Classroom / Lab / Workshop / Industry

WEEKLY SCHEDULE OF TRAINING

Scheduled Week	Module Title	Learning Units	Remarks
Week 1	**Introduction**	• Course Introduction • **Motivational Lecture** (For further detail please see Page No: 4-5) • Application of the course • Job market overview • **Institute/Work ethics**(For further detail please see Annexure-II at the end) • Health & Safety	**Task-1** (Details may be seen at Annexure-I)
Week 2	**Basic Numeracy**	• Recognize basic arithmetic symbols. • State the correct sequence for arithmetical operations and solve equations. • Common Weights and Measures • Units of Measurements & Their interconversion. • Identify two- and three dimensional shapes which may include: Rectangle, Triangle, Sphere, Cube, Cylinder, Pyramid, Square, Polygons, Circle, Cuboids • Calculate area andvolume of regular shapesand objects • Demonstrate basiccalculation procedures related to money andtime, including whole numbers, simple fractionsand decimals • Demonstrate knowledgeof graphs and tables • Demonstrate use ofsimple formulae and algebraic expressions mayrelate to: Area, Perimeter, Dimensions of regular andirregular shapes	**Task-2** (Details may be seen at Annexure-I)

Week 3	**Basic Electricity Concept**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Definition of electricity • Insulator, Conductor & Semi-Conductor (Properties &examples) • Describe Voltage, Voltage Drop, Current, Resistance, Electric Charge, Conductance, Load and their units • Relation between current (I), voltage (V) and resistance (R) • Ohm's Law • Laws of resistance • Factors affecting resistance of conductors • Tools & Equipment used by an Electrician • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-3** (Details may be seen at Annexure-I)
Week 4	**Basic Electric circuits**	• Alternating & Direct Current (AC & DC) • Importance of polarity in DC circuits • Electric Circuit & its types Series Circuit Parallel Circuit Series-Parallel Circuit Open Circuit Closed Circuit Short Circuit • Calculate electrical quantities (Voltage, Current, Resistance and Power etc.) in circuits • Basic Symbols of Electricity • **Case Study** (Health & Safety) (For further detail please see Page No: 6-7)	**Task-4** (Details may be seen at Annexure-I) **1st Monthly Test**
Week 5	**Electrical wiring system**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Methods of electrical wiring systems • Joint box or tee or jointing system • Loop-in or looping system • Cleat Wiring • Advantages and Disadvantages of Cleat Wiring • Casing and Capping Wiring • Advantages and Disadvantages of Casing Capping Wiring • Lead sheathed wiring • Conduit wiring	**Task-5** (Details may be seen at Annexure-I)

		• Surface conduit wiring • Concealed conduit wiring • PVC pipe or PVC conduit • Types of Conduit • Advantage and Disadvantages of Conduit Wiring Systems • Comparison between Different Wiring Systems.	
Week 6	**Electrical Measuring Instruments** **Demonstrate routine electrical measurement procedures**	• Electrical Measuring Instruments & its Applications (Voltmeter, Ampere Meter, Ohmmeter, Watt Meter, Energy Meter, Multimeter, Clamp meter/Tong Tester, Frequency Meter, Power Factor Meter, Tachometer, Megger, Earth Tester, Potentiometer, Pyrometer, Temperature Gun, etc.) • Methods to connect the above electrical measuring instruments in circuit. • Demonstrate procedures or inspecting wiring and distribution board • Conduct operational and functional tests • Demonstrate log out/tag out & labeling procedures • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-6** (Details may be seen at Annexure-I)
Week 7	**uninterruptible power supply (UPS)**	• Introduction to UPS • Types of UPS • Operation and working principal of UPS • Block diagram of UPS • Components of UPS& their functions • Circuit description • **Case Study** (Health & Safety) (For further detail please see Page No: 6-7)	**Task-7** (Details may be seen at Annexure-I)
Week 8	**Assembling & Installation of UPS**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Procedural steps of UPS • Assembling of UPS • UPS settings/configuration • Installation of UPS • Testing procedure of UPS	**Task-8** (Details may be seen at Annexure-I)

		• Transformer based and transformer less Ups • Merits& characteristics of online & offline UPS	**2nd Monthly Test**
Week 9	**Operation & maintenance of UPS**	• General maintenance of UPS • Parameters effecting the efficiency of UPS • UPS operation modes • UPS ratings and power factor • UPS topologies • Importance of UPS • Different brands of Ups • Difference between inverter & UPS • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-9** (Details may be seen at Annexure-I)
Week 10	**Introduction to Renewable energy**	• Introduction to renewable energy source • Describe the following: Solar energy, Wind energy, Bio-fuel / bio-mass energy, Geothermal energy, Enhanced geothermal sources (egs), Dry-steam power stations, Flash steam power stations, Binary cycle power stations, Tidal energy. • Advantages and disadvantages of solar power. • **Case Study** (For further detail please see Page No: 6-7)	**Task-10** (Details may be seen at Annexure-I)
Week 11	**Solar PV System**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Solar radiation • Basic Solar PV System • PV cell types • Comparison of different cell types • Electrical characteristics of PV cells • PV connection series and parallel • Wiring solar panels in a series and in parallel circuit • Peak sun hour • Irradiance • Tilt angle • Example of various tilt angle	**Task-11** (Details may be seen at Annexure-I)

Week 12	**Solar PV System** **Continued…**	• Interconnection of cell and modules • Bypass diode • Peak load • Peak load and base load defined • Load factor& load analysis • Applications of solar photovoltaic (PV) • Solar hybrid power systems • Photovoltaic wires & cables • Solar Home Systems(SHS) • Solar PV Technology • Stand-alone small solar electric systems • On- grid solar system and its component • Equipment required for grid-connected systems • Inverters – standalone and grid connected • PV mounting systems • Battery storage technology • Balance of system equipment • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-12** (Details may be seen at Annexure-I)
Week 13	**Overview of the previous weeks& Mid Term Examination**		
Week 14	**Description of Batteries**	• Overview of Mid Term Exam • Battery Construction • Type of lead-acid batteries • Profile of battery voltage • Charging efficiency • Maintenance of electrolyte • Maintenance of electrodes and cells • Series and parallel connections of batteries • Introduction to charge controller • Blocking reverse current • Preventing overcharge • Overload protection • Low voltage disconnect (LVD) • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-13** (Details may be seen at Annexure-I)

Week 15	**Description of Charge Controllers**	• Types of charge controllers • Plus Width Modulation(PWM) charge controller • Maximum power point tracking (MPPT) charge controller • Connection sequence of charge controllers • Disconnecting of sequence of charge controller • Difference between PWM & MPPT charge controllers • **Case Study** (For further detail please see Page No: 6-7)	**Task-14** (Details may be seen at Annexure-I)
Week 16	**Description of Inverters**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Introduction to inverters • Types of inverters • Operation and working principal of inverter • Components of inverter • Solar inverter • Classification of solar inverter • Maximum power point tracking • Solar micro inverter • Grid tied solar inverters • Solar pumping inverters • Installation of hybrid solar inverter	**Task-15** (Details may be seen at Annexure-I) **4th Monthly Test**
Week 17	**Description of Inverters. Cont…** **Job search/ Entrepreneurial skills(Job Search)**	• Hybrid inverter settings • Parallel operation of hybrid inverter • **Job market & job search** • Job related skills. • Interpersonal skills • Communication skills • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	
Week 18	**Home based solar Energy system**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Designing and implementing a home based solar powered energy system	**Task-16** (Details may be seen at Annexure-I)

	Job search/ Entrepreneurial skills(CV Making)	• **Session on CV Building.** • How to make notable CV. • Dos and Don'ts of CV making.	
Week 19	**Designing of PV system**	• Design of PV system • Site assessments & planning • Load & energy demand assessment • Off-grid PV system design & component sizing • System protection and safety equipment sizing • Cable sizing • PV array design requirements • Matching array & inverter for on-grid system • System design considerations • Typical system components • **Case Study** (For further detail please see Page No: 6-7)	**Task-17** (Details may be seen at Annexure-I)
Week 20	**Job search/ Entrepreneurial skills(Self business)**	• **Session on Self-Employment** • How to start a Business. • Requirements (Capital, Physical etc) • Benefits/Advantages of self-employment • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-18** Continued… **5th Monthly Test**
Week 21	**Installation of PV System**	• **Motivational Lecture**(For further detail please see Page No: 4-5) • Basic Steps to install PV System • Basics steps for mounting solar panels • Shade structure • Building-Integrated PV array (BIPV) • Factors affecting output • Estimation of losses & system yield calculation • Overall project coordination • System installation/commissioning	**Task-19** (Details may be seen at Annexure-I)
Week 22	**Describe Protective devices**	• Fuses: Construction, Operation/working Principal, Types & Applications. • Installation of fuses.	**Task-20** (Details may be seen at Annexure-I)

		• Circuit Breakers: Construction, Operation/working Principal, Types & Applications. • Installation of circuit breakers • Lightning arrestors: Construction, Operation/working Principal, Types & Applications • Installation of lightning arrestors. • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	
Week 23	**Job search/ Entrepreneurial skills**(General Overseas Employment)	• **Session on General Overseas Employment opportunities.** • Job search Avenues. • Visa Processes and other necessary requirements. • Immigration Information (Legal age requirements, Health Certificate, Police Clearance &Travel Insurance) • **Success story**(For further detail please see Page No: 5-6 and Annexure-III at the end)	**Task-21** (Details may be seen at Annexure-I)
Week24	**Maintenance and Troubleshooting of PV systems**	• General maintenance of solar system • Azimuth & tilt angle • Assuring proper solar PV array performance • Inspection techniques • Parameters effecting the efficiency of solar PV system • Introduction to troubleshooting • Zero power output and low voltage issue • Shading and temperature • Bad connections • Solar panel defects • Quality of solar panel • Panel cost vs. Value - other factors • PID resistance and LID resistance	**Task-22** (Details may be seen at Annexure-I)
Week 25	**Street light system (Automatic)**	• **Motivational Lecture** (For further detail please see Page No: 4-5) • Designing, operation and maintenance of Street light system (Automatic)	**Task-23** (Details may be seen at Annexure-I)

	Job search/ Entrepreneurial skills(2 countries)	• Selection of two countries of destination (Gulf Countries, Malaysia, South Korea etc) focusing on:- I. Trade specific Job Prospects and Earning levels in that country. II. Country Specific Labor laws, entry and exit requirements (Legal age requirements, Health Certificate, Police Clearance & Travel Insurance etc.).	
Week 26	**Final Assessment**	• Course Overview& preparation for Exam • Final Assessment	**Final Assessment**

Annexure-I

Tasks for UPS & Solar PV Technician

Note: The following tasks are required to be performed multiple times by each trainee/group until sufficient proficiency level is acquired. The trainer is required to determine the number of times the task needs to be repeated by a trainee as per his/her low/medium/high level of skill and proficiency during any stage of the course.

Task No.	Task
1	Prepare safety charts. Showing General & Trade specific safety measure (text/pictorial). Each trainee will prepare different chart.
2	i. Find area of a circle having radius = 6cm, also convert the result into inches. ii. Find area of a square having each side = 3 inches, also convert the result into mm. iii. Find area of a triangle having height = 8.6 cm & base = 0.05m, also convert the result into inches. iv. Cylinder having height = 2.25ft & radius = 255mm, also convert the result into meters. (Note: Draw neat and clean sketches of all of the above on drawing sheet)
3	Draw different Tools, Equipment, Measuring Instruments & their symbols. Each trainee to draw sketches of different Tools & Equipment (at least 10) on drawing sheet.
4	Make a series testing board.A series testing board also termed as test lamp is a way that electricians would test or find a “short circuit” somewhere in a residential building. If the lamp glowed at all, it meant that there was load (less than infinite resistance) in the house wiring.
5	Make a staircase circuit and draw its circuit diagram using standard symbols. Staircase circuit is a common switching connection used to operate a lamp from two different places (i.e. above or below the stairs). We can use this circuit at other places also like Store / Bathroom etc.
6	Make Godown or Tunnel wiring circuit and draw its circuit diagram using standard symbols. This circuit is used to operate No. of lamps in a sequential manner by operating only one lamp at a time. It is commonly used in godowns, tunnels, long passages/tracks etc.
7	Draw the block diagram of UPS on drawing sheet.
8	Prepare & install 1KVA UPS

9	Practically demonstrate how to check transistor/FET. Replace faulty transistor/FET of module of a general purpose UPS.
10	Draw the block diagram of a typical solar PV system on drawing sheet showing all the necessary components.
11	a) Calculate solar irradiance on given site with the help of solar watt meter. b) Adjust all parameter to obtain maximum power from solar panel. Trainee to enlist & demand the required material.
12	a) Install the given solar panels on given mounting structures and calculate its output voltage when connected in (i) in series (ii) in parallel b) Verify the characteristics of solar panel.
13	a) Check the specific gravity of the solution of flooded battery with the help of Hydrometer. b) Perform the cold crank test of battery with battery tester. c) Make the battery bank according to given design and connect with inverter.
14	Practically demonstrate & verify the connecting & disconnecting sequence of charge controllers.
15	Install the given inverter according to standards given in user manual
16	Operate the following DC load using solar energy with battery backup, make proper distribution board for the load and install DC voltmeter & ammeter to measure the voltage and current taken by the installation. Also draw block & circuit diagrams of the complete setup on drawing sheet using standard symbols. a) DC lights of appropriate ratings = 02 nos. b) AC/DC ceiling fan = 01 no. c) DC room cooler = 01 no.
17	A house comprises of the following electrical load: a) Lighting Load: i. Energy saver (24 W) = 10 nos. ii. Energy saver (11 W) = 03 nos. b) Sealing Fans = 04 nos. c) Pedestal Fan = 01 no. d) Exhaust fan = 01 no. e) Electric iron = 01 no. f) Electric water pump (1/4 HP) = 01 no. g) Refrigerator = 01 no. h) Washing machine = 01 no. i) Food factory = 01 no. j) TV / LED = 01 no. k) Air Conditioner (1 ton) = 01 no. l) Room Cooler = 02 nos. m) Microwave oven = 01 no.

	n) Computer = 01 no. o) Sandwich maker = 01 no. p) Toaster = 01 no. q) Mobile charger = 03 nos. r) Socket outlet = 05 nos. Perform the following: i. Calculate the entire electrical load ii. Design solar PV system except load at (e, f, g, h, k, m, o, and p)
18	a) Inter connect given string or array according to given plan and verify all parameters. b) Make the software configuration according to needs
19	Draw the wiring/circuit diagram of any of the lab/workshop of your institute. "From Main Board to final circuit using standard symbols. (should be made on drawing sheet) For wiring/circuit diagram each trainee will select different lab/workshop. In case less number of labs/workshops, the trainees can select two offices of admin block/two class rooms etc."
20	Repeat task-16 for the same AC load.
21	a) How to use shad analysis tool for survey of given site. b) Make the series of solar panels and measure all parameters. c) Make parallel connection of given solar panels and measures all parameters.
22	Prepare and demonstrate automatic streetlight system using solar energy. Also draw its circuit diagram using standard symbols.

Annexure-II

Workplace/Institute Ethics Guide

Work ethic is a standard of conduct and values for job performance. The modern definition of what constitutes good work ethics often varies. Different businesses have different expectations. Work ethic is a belief that hard work and diligence have a moral benefit and an inherent ability, virtue or value to strengthen character and individual abilities. It is a set of values centered on importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for employee's success:

1. **Attendance:**
   Be at work every day possible, plan your absences don't abuse leave time. Be punctual every day.
2. **Character:**
   Honesty is the single most important factor having a direct bearing on the final success of an individual, corporation, or product. Complete assigned tasks correctly and promptly. Look to improve your skills.
3. **Team Work:**
   The ability to get along with others including those you don't necessarily like. The ability to carry your own weight and help others who are struggling. Recognize when to speak up with an ideas and when to compromise by blend ideas together.
4. **Appearance:**
   Dress for success, set your best foot forward, personal hygiene, good manner, remember that the first impression of who you are, can last a life time
5. **Attitude:**
   Listen to suggestions and be positive, accept responsibility. If you make a mistake, admit it. Values workplace safety rules and precautions for personal and co-worker safety. Avoids unnecessary risks. Willing to learn new processes, systems and procedures in light of changing responsibilities.

6. **Productivity:**

   Do the work correctly, quality and timelines are prized. Get along with fellows, cooperation is the key to productivity. Help out whenever asked, do extra without being asked. Take pride in your work, do things the best you know how. Eagerly focuses energy on accomplishing tasks, also referred to as demonstrating ownership. Takes pride in work.

7. **Organizational Skills:**

   Make an effort to improve, learn ways to better yourself. Time management; utilize time and resources to get the most out of both. Takes an appropriate approach to social interactions at work. Maintains focus on work responsibilities.

8. **Communication:**

   Written communication, being able to correctly write reports and memos. **Verbal communications,** being able to communicate one on one or to a group.

9. **Cooperation:**

   Follow institute rules and regulations, learn and follow expectations. Get along with fellows, cooperation is the key to productivity. Able to welcome and adapt to changing workplace situations and the application of new or different skills.

10. **Respect:**

    Work hard, work to the best of your ability. Carry out orders, do what's asked the first time. Show respect, accept and acknowledge an individual's talents and knowledge. Respects diversity in the workplace, including showing due respect for different perspectives, opinions and suggestions.

Annexure-III

Suggestive Format and Sequence Order of Success Story

S. No	Key Information	Detail/Description
1.	**Self & Family background**	• Self-introduction • Family background and socio economic status, • Education level and activities involved in • Financial hardships etc
2.	**How he came on board NAVTTC Training/ or got trained through any other source**	• Information about course, apply and selection • Course duration, trade selection • Attendance, active participation, monthly tests, interest in lab work
3.	**Post training activities**	• How job / business (self-employment) was set up • How capital was managed (loan (if any) etc). • Detail of work to share i.e. where is job or business being done; how many people employed (in case of self-employment/ business) • Monthly income or earnings and support to family • Earning a happy life than before
4.	**Message to others (under training)**	• Take the training opportunity seriously • Impose self-discipline and ensure regularity • Make Hard work pays in the end so be always ready for the same.

Note: Success story is a source of motivation for the trainees and can be presented in a number of ways/forms in a NAVTTC skill development course as under: -

1. To call a passed out successful person of institute. He/she will narrate his/her success story to the trainees in his/her own words and meet trainees as well.
2. To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful person Audio video recording that has to cover the above mentioned points.
3. The teacher displays the picture of a successful trainee (name, trade, institute, organization, job, earning per month etc) and narrates his/her story in teacher's own motivational words.