

Government of Pakistan

**National Vocational and Technical Training Commission**

**Prime Minister's Hunarmand Pakistan Program**

"Skills for All"



**Course Contents / Lesson Plan**

**Course Title: HVAC**

**Duration: 6 Months**

**Revised Edition**

Trainer Name	
Course Title	<b>HVAC</b>
Objectives and Expectations	<p><b>Employable skills and hands-on practice for HVAC</b></p> <p>This course offers a broad, cross-disciplinary learning experience for students looking to pursue career in HVAC. The needs for superior HVAC technology have increased in keeping with the demands for a wide variety of performances such as high productivity, high quality, as well as labor and cost savings. This course will provide participants with an integrated approach to learn about the various aspects of HVAC and allied technologies.</p> <p><b><u>Main Expectations:</u></b></p> <p>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.</p> <p>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 trainee to prepare them for such market roles during/after the training.</p> <ol style="list-style-type: none"> <li>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.</li> <li>ii. To materialize the main expectations, a special module on <b><u>Job Search &amp; Entrepreneurial Skills</u></b> has been included in the latter part of this course (5<sup>th</sup> &amp; 6<sup>th</sup> 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 form 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.</li> <li>iii. A module on <b><u>Work Place Ethics</u></b> has also been included to highlight the importance of good and positive behavior in the workplace 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</li> </ol>

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 the Pakistani workforce would undergo a positive transformation in the local as well as international job markets.

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 a 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.

#### **(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 the 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.

The 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 a longer time without boredom and loss of interest because they can 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.

Course-related motivational lectures online link is available in **Annexure-II**.

### (ii) Success Stories

Another effective way of motivating the trainees is using 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 using 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 comprehensible words. Moreover, it is helpful if it is assumed that the reader/listener knows nothing of what is being revealed. The 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 in **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 the classroom 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 be presented to the trainees. The trainer may adopt a PowerPoint presentation or video format for such case studies whichever is deemed suitable but only those cases must be selected that are relevant and of a learning value.

The Trainees should be required and supervised to carefully analyze the cases.

For this purpose, they must be encouraged to inquire and collect specific information/data, actively participate in the discussions, and intended solutions to 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)

	<ul style="list-style-type: none"> <li>ii. Health &amp; Safety case studies (2 cases regarding safety and industrial accidents must be arranged by the training institute)</li> <li>iii. Field visits (At least one visit to a trade-specific major industry/ site must be arranged by the training institute)</li> </ul>
<b>Entry-level of trainees</b>	Intermediate
<b>Learning Outcomes of the course</b>	<p>By the end of this course, students will be able to:</p> <ul style="list-style-type: none"> <li>• Identify different types of refrigerated coolers and display cases and describe each one's common application.</li> <li>• Identify single, multiple, and satellite compressor systems. Describe the applications, installation considerations, and advantages and disadvantages of each type.</li> <li>• Identify packaged condensing units and unit coolers. Describe their applications, operation, and installation considerations.</li> <li>• Identify two-stage compressors and explain their operation and applications.</li> <li>• Identify the various accessories used in commercial refrigeration systems.</li> <li>• Identify the various refrigeration control devices. Explain the purpose of each type and how it works.</li> </ul>
<b>Course Execution Plan</b>	<p>The total duration of the course: <b>6 months (26 Weeks)</b>  Class hours: <b>4 hours per day</b>  Theory: <b>20%</b>  Practical: <b>80%</b>  Weekly hours: <b>20 hours per week</b>  Total contact hours: <b>520 hours</b></p>
<b>Companies offering jobs in the respective trade</b>	<ul style="list-style-type: none"> <li>1 Air Conditioners Manufacturing Industry</li> <li>2 Refrigerators Manufacturing Industry</li> <li>3 Air Conditioned Commercial Units</li> <li>4 Air Conditioned Industrial Units</li> <li>5 Sale shops of Refrigeration &amp; Air Conditioning Appliances</li> <li>6 Installation Firms of Air Conditioners</li> </ul>
<b>Job Opportunities</b>	<p>All over the world there is a high demand in the HVAC industry for technicians in various fields. With the help of this course, we will be able to give technical trainings of HVAC to our youth. There are also opportunities for start-up entrepreneurship due to the high demand in the market in following designated jobs;</p> <ul style="list-style-type: none"> <li>1. HVAC Engineer</li> <li>2. HVAC Technician</li> <li>3. HVAC Technician Lead</li> <li>4. HVAC Design Engineer</li> </ul>
<b>No of Students</b>	25
<b>Learning Place</b>	Classroom / Lab
<b>Instructional Resources</b>	<ul style="list-style-type: none"> <li>1. Modern Refrigeration &amp; Air Conditioning Athous Tranquest And Good Heart</li> </ul>

	<ol style="list-style-type: none"><li>2. Principles of Refrigeration R.J Dossat</li><li>3. Refrigeration &amp; Air Conditioning Practice Billy C. Langelly</li><li>4. Trane Air Conditioning Manual Trane Company USA</li><li>5. ASHRAE Handbook – HVAC Systems and Equipment. Atlanta, GA: American Society of Heating, Refrigerating, and Air Conditioning Engineers, Inc.</li><li>6. HVAC Systems Design Handbook. Blue Ridge Summit, PA: TAB Books, Inc.</li></ol>
--	--

## MODULES

Scheduled Weeks	Module Title	Learning Units	Remarks
Week 1	Introduction to HVAC	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b> (<i>For further detail please see Page No: 3&amp; 4</i>)</li> <li>• <b>Job market</b></li> <li>• <b>Course Applications</b></li> <li>• <b>Institute/work ethics</b> <ul style="list-style-type: none"> <li>• <b>Introduction to HVAC</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Heating</li> <li>▪ Ventilation</li> <li>▪ Air Conditioning</li> </ul> </li> <li>• <b>Blueprints, Careers, and Training</b> <ul style="list-style-type: none"> <li>▪ Blueprints, Codes, and Specifications</li> <li>▪ Careers in HVAC</li> </ul> </li> </ul> </li> </ul>	<p><b>Home Assignment</b></p> <ul style="list-style-type: none"> <li>• <b>Task 1</b></li> <li>• <b>Task 2</b></li> <li>• <b>Task 3</b></li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>
Week 2	Trade Mathematics	<ul style="list-style-type: none"> <li>• <b>Success stories</b> (<i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Metric System</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Metric Units</li> <li>▪ Length, Area, and Volume</li> <li>▪ Mass Versus Weight</li> <li>▪ Pressure and Acceleration</li> <li>▪ Temperature Scales</li> </ul> </li> <li>• <b>Scientific Notation, Powers and Roots, and Algebra</b> <ul style="list-style-type: none"> <li>▪ Scientific Notation</li> <li>▪ Powers and Roots</li> <li>▪ Introduction to Algebra</li> </ul> </li> <li>• <b>Geometry and Right Triangles</b> <ul style="list-style-type: none"> <li>▪ Introduction to Geometry</li> <li>▪ Working with Right Triangles</li> </ul> </li> <li>• <b>Converting Units, Review, and Testing</b> <ul style="list-style-type: none"> <li>▪ Converting Decimal Feet to Feet and Inches and Visa Versa</li> </ul> </li> </ul>	<p>This is a knowledge-based module; there are no Performance Tasks.</p>
Week 3	Copper Tubing, Soldering and Brazing	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• Installation Precautions</li> <li>• Materials</li> <li>• Types of Copper Tubing</li> <li>• Cutting Tubing</li> <li>• Bending Tubing</li> <li>• Joining Copper Tubing</li> <li>• <b>Introduction to Soldering</b> <ul style="list-style-type: none"> <li>▪ Soldering</li> <li>▪ Solders and Soldering Fluxes</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 4</b></li> <li>• <b>Task 5</b></li> <li>• <b>Task 6</b></li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>

		<ul style="list-style-type: none"> <li>▪ Preparing Tubing and Fittings for Solder</li> <li>▪ Soldering Joints</li> <li>• <b>Brazing Copper Fittings and Tubing</b> <ul style="list-style-type: none"> <li>▪ Filler Metal and Fluxes</li> <li>▪ Preparing Tubing and Fittings for Brazing</li> <li>▪ Setup of Brazing Heating Equipment</li> <li>▪ Purging</li> <li>▪ Brazing Joints</li> </ul> </li> </ul>	
<b>Week 4</b>	<b>Basic Electricity</b>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Electricity and Voltage</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Electricity</li> <li>▪ AC and DC Voltage</li> <li>▪ Electrical Current Characteristics</li> </ul> </li> <li>• <b>Electrical Circuits and Components</b> <ul style="list-style-type: none"> <li>▪ Electrical Circuits</li> <li>▪ Magnetism</li> <li>▪ Electrical Components</li> </ul> </li> <li>• <b>Electrical Safety, Diagrams, and Controls</b> <ul style="list-style-type: none"> <li>▪ Electrical Safety</li> <li>▪ Circuit Diagrams</li> <li>▪ Electrical Controls</li> </ul> </li> <li>• <b>Electrical Measuring Instruments</b> <ul style="list-style-type: none"> <li>▪ Ammeter</li> <li>▪ Multimeter</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 7</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p> <ul style="list-style-type: none"> <li>• <b>Monthly Test 1</b></li> </ul>
<b>Week 5</b>	<b>Introduction to Cooling and Heating</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Fundamentals of Cooling</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Heat</li> <li>▪ Heat Transfer</li> <li>▪ Pressure</li> <li>▪ Instruments Used to Measure Temperature and Pressure</li> </ul> </li> <li>• <b>Mechanical Refrigeration System</b> <ul style="list-style-type: none"> <li>▪ System Components</li> <li>▪ Refrigeration Cycle</li> </ul> </li> <li>• <b>Refrigerants</b> <ul style="list-style-type: none"> <li>▪ Trade Names</li> <li>▪ Ammonia</li> <li>▪ Fluorocarbon Refrigerants</li> <li>▪ Refrigerant Containers</li> <li>▪ Identifying Refrigerants</li> <li>▪ Refrigerant Safety Precautions</li> </ul> </li> <li>• <b>Compressors</b> <ul style="list-style-type: none"> <li>▪ Reciprocating Compressors</li> <li>▪ Rotary Compressors</li> <li>▪ Scroll Compressors</li> <li>▪ Screw Compressors</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 8</b></li> <li>• <b>Task 9</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>

		<ul style="list-style-type: none"> <li>▪ Centrifugal Compressors</li> <li>• <b>Condensers</b> <ul style="list-style-type: none"> <li>▪ Air-Cooled Condensers</li> <li>▪ Water-Cooled Condensers</li> <li>▪ Evaporative Condensers</li> </ul> </li> <li>• <b>Evaporators</b> <ul style="list-style-type: none"> <li>▪ Direct Expansion (DX) Evaporators</li> <li>▪ Flooded Evaporators</li> <li>▪ Evaporator Construction</li> </ul> </li> <li>• <b>Fundamentals of Heating</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Heat Transfer</li> <li>▪ Temperature and Heat Measurement</li> <li>▪ Combustion</li> </ul> </li> <li>• <b>Forced-Air Furnaces</b> <ul style="list-style-type: none"> <li>▪ Types</li> <li>▪ Heat Exchangers</li> <li>▪ Condensing Furnaces</li> <li>▪ Fans, Motors, Air Filters, and Blowers</li> <li>▪ Humidifiers</li> <li>▪ Installation</li> </ul> </li> <li>• <b>Gas Furnaces</b> <ul style="list-style-type: none"> <li>▪ Flame Ignition</li> <li>▪ Gas Valve Assembly</li> <li>▪ Components</li> <li>▪ Safety Switches</li> <li>▪ Maintenance</li> <li>▪ Manifold Pressure</li> </ul> </li> <li>• <b>Electric Heating</b> <ul style="list-style-type: none"> <li>▪ Heating Elements</li> <li>▪ Components</li> <li>▪ Power Supply</li> <li>▪ Hydronic Heating Systems</li> </ul> </li> </ul>	
<b>Week 6</b>	<b>Air Distribution Systems</b>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Air Distribution Systems</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Air Distribution Systems</li> <li>▪ Fans and Blowers</li> </ul> </li> <li>• <b>Duct Systems</b> <ul style="list-style-type: none"> <li>▪ Duct Systems Used in Cold Climates</li> <li>▪ Duct Systems Used in Warm Climates</li> <li>▪ Duct System Components</li> <li>▪ Duct Hangers and Supports</li> </ul> </li> <li>• <b>Instruments and Measurements</b> <ul style="list-style-type: none"> <li>▪ Temperature and Humidity Measurements</li> <li>▪ Air Distribution System Measurements</li> <li>▪ Air Velocity Measurements</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 10</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>
<b>Week 7</b>	<b>Leak Detection, Evacuation, Recovery, and</b>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p>	

	<b>Charging</b>	<ul style="list-style-type: none"> <li>• <b>Introduction and Leak Detection</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Detection Devices</li> <li>▪ Leak Testing</li> </ul> </li> <li>• <b>Refrigerant Containment</b> <ul style="list-style-type: none"> <li>▪ Refrigerant Containment</li> <li>▪ Refrigerant Recovery</li> </ul> </li> <li>• <b>Evacuation</b> <ul style="list-style-type: none"> <li>▪ Evacuation</li> <li>▪ Service Equipment Used for Evacuation</li> <li>▪ Methods of Evacuation</li> <li>▪ Deep Vacuum Evacuation Method</li> <li>▪ Triple Evacuation Method</li> </ul> </li> <li>• <b>Charging I</b> <ul style="list-style-type: none"> <li>▪ Servicing Equipment Used for Charging</li> <li>▪ Charge Determination and Accuracy</li> <li>▪ Charging by Weight</li> </ul> </li> <li>• <b>Charging II</b> <ul style="list-style-type: none"> <li>▪ Charging by Superheat</li> <li>▪ Charging by Subcooling</li> </ul> </li> <li>• <b>Charging III</b> <ul style="list-style-type: none"> <li>▪ Charging Using Pressure Charts</li> <li>▪ Using Zeotrope Refrigerants</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 11</b></li> <li>• <b>Task 12</b></li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>
<b>Week 8</b>	<b>Alternating Current</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Transformers, Power Generation, and Using AC Power</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Transformers</li> <li>▪ Power Generation</li> <li>▪ Using AC Power</li> </ul> </li> <li>• <b>Induction Motors and Testing AC Components</b> <ul style="list-style-type: none"> <li>• Induction Motors</li> <li>• Testing AC Components</li> </ul> </li> <li>• <b>Safety, AC Voltage on Circuit Diagrams, Review and Testing</b> <ul style="list-style-type: none"> <li>▪ Safety</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 13</b></li> </ul> <p><i><u>Details may be seen at Annexure-I</u></i></p>

<p><b>Week 9</b></p>	<p><b>Introduction to Control Circuit Troubleshooting</b></p>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Thermostats</b></li> <li>• <b>HVAC Control Systems</b></li> <li>• <b>Control Circuit Sequence of Operation</b></li> <li>• <b>Organization and Safety</b> <ul style="list-style-type: none"> <li>▪ Using an Organized Approach to Electrical Troubleshooting</li> <li>▪ Safety</li> </ul> </li> <li>• <b>Troubleshooting I: Input Power, Load, and Control Circuits</b> <ul style="list-style-type: none"> <li>▪ HVAC System Troubleshooting</li> <li>▪ HVAC Equipment Input Power, Load, and Control Circuits</li> </ul> </li> <li>• <b>Troubleshooting II: Electrical System</b> <ul style="list-style-type: none"> <li>▪ Electrical Troubleshooting Common to All HVAC Equipment</li> </ul> </li> <li>• <b>Troubleshooting III: Motors</b> <ul style="list-style-type: none"> <li>• Motors and Motor Circuit Troubleshooting</li> </ul> </li> <li>• <b>Hydronic and Pneumatic Systems</b></li> <li>• <b>Digital Systems</b> <ul style="list-style-type: none"> <li>▪ HVAC Digital Control Systems</li> </ul> </li> </ul>	<p style="text-align: center;">• <b>Task 14</b></p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>
<p><b>Week 10</b></p>	<p><b>Heat Pumps</b></p>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture (For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Introduction to Heat Pumps</b> <ul style="list-style-type: none"> <li>▪ Heat Pump Operation</li> <li>▪ Heat Pump Classification</li> <li>▪ Heat Pump Refrigeration Cycle</li> </ul> </li> <li>• <b>Heat Pump Components and Controls</b> <ul style="list-style-type: none"> <li>▪ Heat Pump Components</li> <li>▪ Supplemental Electric Heat</li> <li>▪ Heat Pump Performance</li> <li>▪ Heat Pump Balance Point</li> </ul> </li> <li>• <b>Installation</b></li> <li>• <b>Servicing and Troubleshooting</b></li> <li>• <b>Heat Pump Controls</b></li> </ul>	<p style="text-align: center;">• <b>Task 15</b></p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>
<p><b>Week 11</b></p>	<p><b>Basic Installation and Maintenance Practices</b></p>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Mechanical Fasteners</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Mechanical Fasteners</li> <li>▪ Installing Threaded Fasteners</li> <li>▪ Installing Anchor Bolts</li> </ul> </li> <li>• <b>Gaskets, Packing, and Seals</b> <ul style="list-style-type: none"> <li>▪ Gaskets</li> <li>▪ Packing</li> <li>▪ Identifying Seals</li> </ul> </li> </ul>	<p style="text-align: center;">• <b>Task 16</b></p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>

		<ul style="list-style-type: none"> <li>▪ Installing and Removing Seals</li> <li>• <b>Bearings</b> <ul style="list-style-type: none"> <li>▪ Identifying Bearings</li> <li>▪ Removing Bearings</li> <li>▪ Installing Bearings</li> </ul> </li> <li>• <b>Lubrication, Belts, and Belt Drives</b> <ul style="list-style-type: none"> <li>▪ Lubricating Bearings</li> <li>▪ Belts and Belt Drives</li> </ul> </li> <li>• <b>Couplings and Direct Drives</b> <ul style="list-style-type: none"> <li>▪ Couplings and Direct Drives</li> <li>▪ General Coupling Removal and Installation Methods</li> <li>▪ Coupling Alignment</li> <li>▪ Basic Maintenance Procedures</li> </ul> </li> <li>• <b>Documentation and Customer Relations</b> <ul style="list-style-type: none"> <li>▪ Documentation</li> <li>▪ Customer Relations</li> <li>▪ Customer Communications</li> </ul> </li> </ul>	
<b>Week 12</b>	<b>Midterm</b>		
<b>Week 13</b>	<b>Refrigerants and Oils</b>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Refrigerant Structure; Refrigerant Identification</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Desirable Refrigerant Characteristics</li> <li>▪ Common Applications</li> <li>▪ Refrigerant Structure</li> <li>▪ Refrigerant Classifications</li> <li>▪ Organic Refrigerants</li> <li>▪ Refrigerants and the Environment</li> <li>▪ Refrigerant Identification</li> <li>▪ Safety Classifications</li> <li>▪ Cylinder Safety</li> </ul> </li> <li>• <b>Refrigerant Composition; Refrigerant Leaks</b> <ul style="list-style-type: none"> <li>▪ Refrigerant Composition</li> <li>▪ Azeotropes, Zeotropes, and Near-Azeotropes</li> <li>▪ Pressure-Temperature Charts</li> <li>▪ Refrigerant Leaks</li> <li>▪ Finding and Isolating Leaks</li> </ul> </li> <li>• <b>Lubricating Oils; Oil and the Refrigeration System; Oil Handling Guidelines; System Conversion</b> <ul style="list-style-type: none"> <li>▪ Lubricating Oils</li> <li>▪ Lubricating Oil Properties</li> <li>▪ Oil Types</li> <li>▪ Oil and the Refrigeration System</li> <li>▪ System Piping</li> <li>▪ Contamination</li> <li>▪ Oil Handling Guidelines</li> <li>▪ Personal Protective Equipment</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Home Assignment</b></li> <li>• <b>Task 17</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>

		<ul style="list-style-type: none"> <li>▪ Working with Oils</li> <li>▪ Waste Oil Disposal</li> <li>▪ System Conversion</li> </ul>	
<b>Week 14</b>	<b>Compressors</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture (For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Introduction; the Role of the Compressor; Open, Hermetic, and Semi-Hermetic Compressors; Types of Compressors</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ The Role of the Compressor</li> <li>▪ Open, Hermetic, and Semi-Hermetic Compressors</li> <li>▪ Types of Compressors</li> <li>▪ Reciprocating Compressors</li> <li>▪ Rotary Compressors</li> <li>▪ Scroll, Screw, and Centrifugal Compressors</li> </ul> </li> <li>• <b>Capacity Control of Compressors; Compressor Electric Motors</b> <ul style="list-style-type: none"> <li>▪ Capacity Control of Compressors</li> <li>▪ On/Off Cycling; Multiple Compressors</li> <li>▪ Cylinder Unloading; Hot Gas Bypass</li> <li>▪ Intake Slide Valve; Inlet Guide Vane</li> <li>▪ Compressor Speed Control; Scroll Capacity Modulation</li> <li>▪ Compressor Electric Motors</li> <li>▪ Compressed Motor Cooling</li> <li>▪ Compressor and Drive Motor Shaft Alignment</li> <li>▪ Input Power</li> <li>▪ Compressor Motor Overload Protection</li> </ul> </li> <li>• <b>Other Compressor Protection Devices; Reduced-Voltage Motor Starting</b> <ul style="list-style-type: none"> <li>▪ Other Compressor Protection Devices</li> <li>▪ Pressure Protection; Oil Pressure Protection</li> <li>▪ Lockout Protection; Short Cycling Protection</li> <li>▪ Electronic Head Pressure Control</li> <li>▪ Reduced-Voltage Motor Starting</li> </ul> </li> <li>• <b>Causes of Compressor Failure</b> <ul style="list-style-type: none"> <li>▪ Causes of Compressor Failure</li> <li>▪ Slugging; Flooding; Flooded Starts</li> <li>▪ Contamination</li> <li>▪ Electrical</li> <li>▪ Compressor Heating</li> </ul> </li> <li>• <b>System Checkout Following Compressor Failure; Compressor Changeout</b> <ul style="list-style-type: none"> <li>▪ System Checkout Following Compressor Failure</li> <li>▪ Preliminary Inspection</li> <li>▪ Analyzing System Operating Conditions</li> <li>▪ Final Compressor Checks</li> <li>▪ Compressor Changeout</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 18</b></li> </ul> <p><u>Details may be seen at Annexure-I</u></p>

		<ul style="list-style-type: none"> <li>▪ Compressor Replacement Due to Mechanical Failure</li> <li>▪ Compressor Replacement Due to Electrical Failure</li> </ul>	
Week 15	Retail Refrigeration Systems	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li>   <li>Students are introduced to:</li> <li>• <b>Mechanical Refrigeration Systems</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Mechanical Refrigeration Systems</li> <li>▪ The Refrigeration Cycle</li> <li>▪ Devices and Components</li> </ul> </li> <li>• <b>Defrost Systems</b> <ul style="list-style-type: none"> <li>▪ Defrost Systems</li> <li>▪ Off-Cycle Defrost</li> <li>▪ Timed Defrost</li> <li>▪ Electric Defrost</li> </ul> </li> <li>• <b>Defrost Systems (continued)</b> <ul style="list-style-type: none"> <li>▪ Defrost Systems</li> <li>▪ Hot-Gas Defrost</li> </ul> </li> <li>• <b>Retail Refrigeration Equipment and Fixtures</b> <ul style="list-style-type: none"> <li>▪ Retail Refrigeration Equipment and Fixtures</li> <li>▪ Ice Merchandisers</li> <li>▪ Reach-In Coolers and Freezers</li> <li>▪ Merchandising Walk-In Systems</li> <li>▪ Commercial Ice Makers</li> </ul> </li> <li>• <b>Common Refrigeration System Controls</b> <ul style="list-style-type: none"> <li>▪ Common Refrigeration System Controls</li> <li>▪ Thermostats</li> <li>▪ Pressure Controls</li> <li>▪ Time Delay Relays</li> <li>▪ Solenoid Valves</li> </ul> </li> <li>• <b>Troubleshooting</b> <ul style="list-style-type: none"> <li>▪ Troubleshooting and Maintenance of a Reach-In Freezer</li> <li>▪ Troubleshooting and Maintenance of Cubed-Ice Machines</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 19</b></li>   <li><u>Details may be seen at Annexure-I</u></li> </ul>
Week 16	Troubleshooting Electronic Controls	<ul style="list-style-type: none"> <li>• <b>Success stories (For further detail please see Page No: 3&amp; 4)</b></li>   <li>Students are introduced to:</li> <li>• <b>Microprocessor Controls; Troubleshooting</b></li> <li>• <b>Microprocessor-Controlled Systems; External Causes of Failure;</b></li> <li>• <b>Electronic Controls in Heating Systems</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Microprocessor Controls</li> <li>▪ Troubleshooting Microprocessor-Controlled Systems</li> <li>▪ External Causes of Failure</li> <li>▪ Electronic Controls in Heating Systems</li> </ul> </li> <li>• <b>Cooling Systems and Heat Pumps; Test</b></li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 20</b></li>   <li><u>Details may be seen at Annexure-I</u></li>   <li>• <b>Monthly Test 2</b></li> </ul>

		<b>Instruments; Standardization</b> <ul style="list-style-type: none"> <li>▪ Cooling Systems and Heat Pumps</li> <li>▪ Test Instruments</li> <li>▪ Standardization</li> </ul>	
Week 17	Troubleshooting Heat Pumps	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b> (<i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Heat Pump Operation; Electrical Operating Sequence</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Heat Pump Operation</li> <li>▪ Electrical Operating Sequence</li> </ul> </li> <li>• <b>Troubleshooting</b> <ul style="list-style-type: none"> <li>▪ Control Circuit Field Wiring</li> <li>▪ Thermostats</li> <li>▪ Control Transformer Phasing</li> <li>▪ Speed Controller</li> <li>▪ Magnetic Relays and Solenoid</li> </ul> </li> <li>• <b>Troubleshooting (continued)</b> <ul style="list-style-type: none"> <li>▪ Check Valves</li> <li>▪ Reversing Valves</li> <li>▪ Defrost Control</li> <li>▪ Refrigerant Charge</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 21</b></li> </ul> <p><i>Details may be seen at Annexure-I</i></p>
Week 18	Construction Drawings and Specifications	<ul style="list-style-type: none"> <li>• <b>Success stories</b> (<i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Introduction; Reading Drawings</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Reading Drawings</li> </ul> </li> <li>• <b>Reading Plumbing Plans and Mechanical Plans</b> <ul style="list-style-type: none"> <li>▪ Reading Plumbing Plans</li> <li>▪ Reading Mechanical Plans</li> </ul> </li> <li>• <b>Reading Electrical Plans</b> <ul style="list-style-type: none"> <li>• Reading Electrical Plans</li> </ul> </li> <li>• <b>Request for Information Forms; Specifications</b> <ul style="list-style-type: none"> <li>• Request for Information Forms</li> </ul> </li> <li>• <b>Shop Drawings; Submittals</b> <ul style="list-style-type: none"> <li>▪ Shop Drawings</li> <li>▪ Cut Lists</li> <li>▪ General Procedure</li> </ul> </li> <li>• <b>As-Built Drawings</b> <ul style="list-style-type: none"> <li>• As-Built Drawings</li> </ul> </li> <li>• <b>Takeoffs</b> <ul style="list-style-type: none"> <li>▪ A Takeoffs</li> <li>▪ Takeoff Tools and Materials</li> <li>▪ Selecting Equipment and Materials</li> <li>▪ Takeoff Procedures</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 22</b></li> </ul> <p><i>Details may be seen at Annexure-I</i></p>
Week 19	Heating and Cooling System Design	<ul style="list-style-type: none"> <li>• <b>Success stories</b> (<i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul>	<ul style="list-style-type: none"> <li>• <b>Task 23</b></li> </ul> <p><i>Details may</i></p>

		<p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Overview of the Design Process</b></li> <li>• <b>Building Evaluation/Survey</b></li> <li>• Introduction <ul style="list-style-type: none"> <li>▪ Overview of the Design Process</li> <li>▪ Building Evaluation/Survey</li> </ul> </li> <li>• <b>Load Estimating</b> <ul style="list-style-type: none"> <li>▪ Heat Transfer</li> <li>▪ Heat Gain and Loss</li> <li>▪ Cooling and Heating Load Factors</li> <li>▪ Preparing the Load Estimate</li> <li>▪ Load Estimating Software</li> </ul> </li> <li>• <b>Equipment Selection</b> <ul style="list-style-type: none"> <li>▪ Equipment Selection</li> <li>▪ Cooling Equipment Selection</li> <li>▪ Heating Equipment Selection</li> <li>▪ Heat Pump Selection</li> </ul> </li> <li>• <b>Air Distribution System Duct Design</b> <ul style="list-style-type: none"> <li>▪ Duct System Basics</li> <li>▪ Air Distribution Duct Systems</li> <li>▪ Duct System Components</li> <li>▪ Duct System Design</li> <li>▪ Other Duct System Design Considerations</li> </ul> </li> <li>• <b>Support Systems; Load Estimating for Commercial Buildings</b> <ul style="list-style-type: none"> <li>▪ Support Systems</li> <li>▪ Refrigerant Piping</li> <li>▪ Condensate Piping</li> <li>▪ Electrical Service</li> <li>▪ Load Estimating for Commercial Buildings</li> </ul> </li> </ul>	<p><u>be seen at Annexure-I</u></p>
<p><b>Week 20</b></p>	<p><b>Commercial and Industrial Refrigeration Systems</b></p>	<ul style="list-style-type: none"> <li>• <b>Success stories ( For further detail please see Page No: 3&amp; 4)</b></li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• <b>Refrigeration and the Preservation of Food Products;</b></li> <li>• <b>Refrigerated Transport Units</b> <ul style="list-style-type: none"> <li>▪ Introduction</li> <li>▪ Refrigeration and the Preservation of Food Products</li> <li>▪ Cold Storage</li> <li>▪ Commercial Freezing Methods</li> <li>▪ Refrigerated Transport Units</li> <li>▪ Refrigerated Shipboard Containers</li> <li>▪ Trailer and Truck Units</li> <li>▪ Refrigerated Railcars</li> </ul> </li> <li>• <b>Refrigeration Systems and Components; Accessories</b> <ul style="list-style-type: none"> <li>▪ Refrigeration Systems and Components</li> <li>▪ Compressors</li> <li>▪ Condensers</li> <li>▪ Evaporators</li> <li>▪ Display Cases</li> </ul> </li> </ul>	<p>• <b>Task 24</b></p> <p><u>Details may be seen at Annexure-I</u></p>

		<ul style="list-style-type: none"> <li>▪ Accessories</li> <li>• <b>Refrigeration System Control Devices, Part I</b> <ul style="list-style-type: none"> <li>▪ Crankcase Pressure Regulating Valves</li> <li>▪ Evaporator Pressure Regulating Valves</li> <li>▪ Air-Cooled Condenser Pressure Regulator</li> <li>▪ Bypass Control Valves</li> <li>▪ Capacity Control Devices</li> </ul> </li> <li>• <b>Refrigeration System Control Devices II</b> <ul style="list-style-type: none"> <li>▪ Pump-Down Control</li> <li>▪ Defrost Systems</li> </ul> </li> <li>• <b>Ammonia Refrigeration Systems; Secondary Coolants</b> <ul style="list-style-type: none"> <li>▪ Ammonia Refrigeration Systems</li> <li>▪ Secondary Coolants</li> </ul> </li> </ul>	
<b>Week 21</b>	<p><b>Employable Project/ Assignment (6 weeks) i.e. 21-26 besides regular classes.</b></p> <p style="text-align: center;"><b>OR</b></p> <p><b>On the job training ( 2 weeks)</b></p>	<ul style="list-style-type: none"> <li>• Guidelines to the Trainees for selection of students employable project like final year project (FYP)</li> <li>• Assign Independent project to each Trainee</li> <li>• A project-based on trainee's aptitude and acquired skills.</li> <li>• Designed by keeping in view the emerging trends in the local market as well as across the globe.</li> <li>• The project idea may be based on Entrepreneur.</li> <li>• Leading to successful employment.</li> <li>• The duration of the project will be 6 weeks</li> <li>• Final viva/assessment will be conducted on project assignments.</li> <li>• At the end of the session, the project will be presented in a skills competition</li> <li>• The skill competition will be conducted on zonal, regional, and National levels.</li> <li>• The project will be presented in front of Industrialists for commercialization</li> <li>• The best business idea will be placed in the NAVTTC business incubation center for commercialization.</li> </ul> <p style="text-align: center;"><b>OR</b></p> <p><b>On the job training for 2 weeks:</b></p> <ul style="list-style-type: none"> <li>• Aims to provide 2 weeks of industrial training to the Trainees as part of the overall training program</li> <li>• Ideal for the manufacturing trades</li> <li>• As an alternative to the projects that involve expensive equipment</li> <li>• Focuses on increasing Trainee's motivation, productivity, efficiency, and</li> </ul>	<b>Monthly Test 6</b>

		quick learning approach.	
<b>Week 22</b>	<b>Capstone Project</b>	<p>Students are provided with details regarding a capstone project that they are required to complete to showcase their learning. The project should ideally consist of the following deliverables:</p> <ol style="list-style-type: none"> <li>1. Design brief/description outlining their project</li> <li>2. Research collected during the project</li> <li>3. Rough sketches, either hand-drawn or digitally created that showcase their design process</li> <li>4. Professionally presented a main body of artwork at the end of the course</li> </ol> <p>Notes for the Trainer/Teacher:</p> <ul style="list-style-type: none"> <li>• Each student must receive a separate/independent project based on their strengths and interests. This will reinforce their motivation and determine their aptitude towards specific design fields.</li> <li>• Each project should be designed keeping future design trends as well as current market demands in mind</li> <li>• The duration for the completion of the project is 4 weeks</li> </ul> <p>It's important to reiterate the value of these projects as each student will later be able to showcase their creative effort in the real world market, giving them leverage over others for better employment.</p> <p>Ideas for projects may be generated via different sites such as:  <a href="https://1000projects.org/">https://1000projects.org/</a>  <a href="https://www.freestudentprojects.com/">https://www.freestudentprojects.com/</a></p>	
<b>Week 23</b>	<b>Introduction to Freelancing</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• the concept of freelancing</li> <li>• how to become freelance and create a sustainable income</li> <li>• pros and cons of freelancing</li> <li>• the ethical and professional way of becoming a productive freelancer</li> <li>• resources available for freelancing in the field of design</li> </ul>	

		<ul style="list-style-type: none"> <li>• how to join freelancing sites</li> <li>• the process of creating a freelancing profile</li> </ul>	
<b>Week 24</b>	<b>Professional practice methods &amp; legal side of design</b>	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• the standards that define the expectations of a professional welder</li> <li>• the principles of integrity that demonstrate respect for the profession, for colleagues, for clients, for audiences or consumers, and society as a whole</li> <li>• the perspectives of the profession i.e. understanding the profession, the meanings of environmental responsibility, copyright, and ethics</li> <li>• what legalities are involved in professional projects</li> <li>• how to build strong professional proposals</li> <li>• copyrights, copyright infringement, plagiarism, crediting creators, purchasing online products, downloading 'free' content</li> <li>• the do's and don'ts of how to price their time, effort, and creativity</li> </ul>	
<b>Week 25</b>	<b>Preparing your portfolio</b>	<ul style="list-style-type: none"> <li>• <b>Motivational Lecture</b>( <i>For further detail please see Page No: 3&amp; 4</i>)</li> </ul> <p>Students are introduced to:</p> <ul style="list-style-type: none"> <li>• the concept of design portfolios</li> <li>• the concept of present design work/projects in a professional manner</li> <li>• websites that provide free portfolio hosting such as Behance and Dribbble</li> <li>• creating a portfolio</li> <li>• how to select work for presenting in your portfolio</li> </ul>	<b>Final Assessment</b>
<b>Week 26</b>	<b>Entrepreneurship and Final Assessment in project</b>	<ul style="list-style-type: none"> <li>• <b>Success stories</b> ( <i>For further detail please see Page No: 3&amp; 4</i>)</li> <li>• Job Market Searching</li> <li>• Self-employment</li> <li>• Introduction</li> <li>• Fundamentals of Business Development</li> <li>• Entrepreneurship</li> <li>• Startup Funding</li> <li>• Business Incubation and Acceleration</li> <li>• Business Value Statement</li> </ul>	

		<ul style="list-style-type: none"><li>• Business Model Canvas</li><li>• Sales and Marketing Strategies</li><li>• How to Reach Customers and Engage</li><li>• Stakeholders Power Grid</li><li>• RACI Model, SWOT Analysis, PEST Analysis</li><li>• SMART Objectives</li><li>• OKRs</li><li>• Cost Management (OPEX, CAPEX, ROCE, etc.)</li><li>• Final Assessment</li></ul>	
--	--	--	--

## Tasks For Certificate in HVAC

Task No.	Task	Description	Week
1.	Find the career path	<ul style="list-style-type: none"> <li>Prepare a career path related to your course and also highlight the emerging trends in the local as well as international market</li> </ul>	Week 1
2.	Work Ethics	<ul style="list-style-type: none"> <li>Generate a report on Institute work ethics and professionalism related to your course</li> </ul>	
3.	Interpret an HVAC drawing	<ul style="list-style-type: none"> <li>Interpret the following within an HVAC drawing provided by the instructor:               <ul style="list-style-type: none"> <li>Piping</li> <li>Air-handling equipment</li> <li>AC system(s)</li> <li>HVAC component diagram</li> <li>Schematics</li> </ul> </li> </ul>	
4.	Perform given copper tubing operations	<ul style="list-style-type: none"> <li>Correctly measure the diameter of copper tubing.</li> <li>Cut and ream copper tubing using a tubing cutter.</li> <li>Correctly bend copper tubing using bending tools.</li> <li>Make a swage joint in a section of copper tubing.</li> <li>Make and join flare connections.</li> <li>Join two sections of tubing using a compression fitting.</li> <li>Cut and join two sections of plastic pipe using appropriate fittings.</li> <li>Identify correct types of copper pipe for given applications.</li> <li>Identify copper pipe sizes and wall thicknesses.</li> </ul>	Week-3
5.	Perform Soldering operation	<ul style="list-style-type: none"> <li>Assemble a propane torch.</li> <li>Light and adjust a propane torch flame.</li> <li>Select correct solder for the intended soldering job.</li> <li>Heat joint to the right temperature and apply solder to fill a joint.</li> <li>Clean and cool a soldered joint.               <ul style="list-style-type: none"> <li>Solder a joint using butane.</li> <li>Solder a joint using acetylene.</li> </ul> </li> </ul>	
6.	Perform Brazing operation	<ul style="list-style-type: none"> <li>Assemble an oxyacetylene torch, including selection of the proper size tip for the job.</li> <li>Light and adjust an oxyacetylene torch flame.</li> <li>Select correct filler metal rod for the intended brazing.</li> <li>Clean and cool the brazed joint.</li> <li>Assemble and operate a pressure regulator system used with an inert gas to purge tubing for brazing.</li> <li>Assemble a brass-to-copper joint.</li> </ul>	
7.	Carry out basic electricity measurements	<ul style="list-style-type: none"> <li>Use a multimeter to measure voltage.</li> <li>Use a multimeter to measure current.</li> <li>Use a multimeter to measure resistance.</li> <li>Use a multimeter to check circuit continuity.</li> <li>Assemble and test series and parallel circuits using a battery, wires and selected load devices.</li> </ul>	Week 4

8.	<b>Perform given tasks in a cooling system</b>	<ul style="list-style-type: none"> <li>• Measure temperatures in an operating air conditioning system.</li> <li>• Use cylinder color codes to identify refrigerants.</li> <li>• Identify compressors, condensers, evaporators, metering devices, controls, and accessories.</li> <li>▪ Use service valves to gain access to an air conditioning system in order to measure pressures using a gauge manifold set.</li> </ul>	<b>Week 5</b>
9.	<b>Perform given tasks in a heating system</b>	<ul style="list-style-type: none"> <li>• Identify the components of an induced draft and condensing gas furnace and state their purpose.</li> <li>• With supervision, turn on and check a gas furnace.</li> <li>• Identify symptoms of combustion problems in a gas furnace and adjust the manifold pressure.</li> <li>• With supervision, perform preventive maintenance procedures on a gas furnace, including filter replacement, cleaning of components, and temperature measurements.</li> </ul>	
10.	<b>Operate Air distribution system measuring devices</b>	<ul style="list-style-type: none"> <li>• Use a tachometer to measure blower motor rpm.</li> <li>• Read and interpret equivalent length charts and required air volume/duct size charts.</li> <li>• Assemble duct and fittings.</li> <li>• Assemble flexible duct.</li> <li>• Install insulation and vapor barriers on metal ducts.</li> <li>• Use a manometer to measure static pressure in a duct system.</li> <li>• Use a velometer to measure the velocity of airflow at the output of air system supply diffusers and registers.</li> </ul>	<b>Week 6</b>
11.	<b>Perform Leak detection test and evacuate the system</b>	<ul style="list-style-type: none"> <li>• Identify the common types of leak detectors and explain the advantages and disadvantages associated with each type.</li> <li>• Use selected electronic, ultrasonic, liquid (bubble), and ultraviolet/fluorescent leak detectors to leak test a pressurized operational system.</li> <li>• Under supervision, use a recovery and/or recovery/recycle unit to recover the refrigerant from a system.</li> <li>• Under supervision, use a mixture of nitrogen and a trace amount of HCFC-22 refrigerant to pressurize a refrigerant system in preparation for leak testing.</li> <li>• Under supervision, demonstrate and/or describe how to evacuate a system using the deep vacuum method.</li> <li>• Perform a vacuum leak test on an evacuated system.</li> <li>• Under supervision, demonstrate how to evacuate a system using the triple evacuation method.</li> <li>• Under supervision, demonstrate how to use dry nitrogen as the moisture-absorbing gas when triple evacuating a system.</li> </ul>	<b>Week 7</b>
12.	<b>Carry our refrigerant charging</b>	<ul style="list-style-type: none"> <li>• Under supervision, demonstrate how to charge a system by weight.</li> <li>• Under supervision, demonstrate how to charge a system using the superheat method.</li> <li>• Under supervision, demonstrate how to charge a system using the subcooling method.</li> <li>• Under supervision, demonstrate how to charge a system using the charging pressure charts method.</li> </ul>	

13.	<b>Interpret AC circuits and drawings</b>	<ul style="list-style-type: none"> <li>• Identify the components used in a given AC circuit and explain their functions.</li> <li>• Identify types of single-phase and three-phase power distribution systems from electrical circuit diagrams.</li> <li>• Following applicable safety practices, test AC components, including transformers, capacitors, and motor windings.</li> <li>• Identify various types of AC motors from schematic diagrams.</li> </ul>	<b>Week 8</b>
14.	<b>Perform thermostat operation and carryout troubleshooting</b>	<ul style="list-style-type: none"> <li>• Identify various types of thermostats and explain their operation and uses.</li> <li>• Install a conventional 24V bimetal thermostat and hook it up using the standard coding system for thermostat wiring.</li> <li>• Check and adjust a thermostat, including heat anticipator setting and indicator adjustment.</li> <li>• Program an electronic programmable thermostat.</li> <li>• Identify electrical, electronic, and pneumatic components and circuits, recognize their diagram symbols, and explain their functions.</li> <li>• Interpret control circuit diagrams.</li> <li>• Perform electrical tests and troubleshooting as follows: <ul style="list-style-type: none"> <li>▪ Single- and three-phase input voltage measurements</li> <li>▪ Fuse and circuit breaker checks</li> <li>▪ Resistive and inductive load checks</li> <li>▪ Switch and contactor/relay checks</li> <li>▪ Control transformer checks</li> </ul> </li> <li>• Perform electrical tests and troubleshooting of compressor and fan motors as follows: <ul style="list-style-type: none"> <li>▪ Start and run capacitor checks</li> <li>▪ Start relay and start thermistor checks</li> <li>▪ Open, shorted, and grounded winding check</li> </ul> </li> </ul>	<b>Week 9</b>
15.	<b>Perform heat pump servicing procedures</b>	<ul style="list-style-type: none"> <li>• Identify components that are unique to heat pumps and explain the function of each.</li> <li>• Calculate the balance point of a heat pump.</li> <li>• Simulate the installation procedures for a heat pump.</li> <li>• Analyze a heat pump circuit diagram and perform simulated troubleshooting exercises.</li> </ul>	<b>Week 10</b>
16.	<b>Perform Mechanical Maintenance operations</b>	<ul style="list-style-type: none"> <li>• Identify different types of threaded fasteners.</li> <li>• Identify non-threaded fasteners.</li> <li>• Identify different types of gaskets.</li> <li>• Identify mechanical seal parts.</li> <li>• Install an oil seal.</li> <li>• Align and properly adjust V-belts.</li> <li>• Identify different types of drive couplings.</li> <li>• Tighten a four-bolt flange.</li> <li>• Install an expandable anchor bolt.</li> <li>• Identify different types of bearings.</li> <li>• Recognize and use a manual bearing puller to remove a bearing.</li> <li>• Recognize and use a feeler gauge to measure bearing clearances.</li> <li>• Lubricate a bearing using a lever-type grease gun.</li> <li>• Fill out typical forms used for installation and service calls.</li> </ul>	<b>Week 11</b>

17.	<b>Handle Refrigerant and Oils</b>	<ul style="list-style-type: none"> <li>• Interpret a P-T chart for an azeotrope refrigerant.</li> <li>• Calculate superheat and subcooling.</li> <li>• Perform a refrigerant leak detection procedure.</li> <li>• Perform a refrigerant retrofit.</li> </ul>	<b>Week 13</b>
18.	<b>Install and Replace Compressors</b>	<ul style="list-style-type: none"> <li>• Identify different types of compressor capacity controls.</li> <li>• Identify protection devices commonly used with compressors.</li> <li>• Under supervision, make electrical troubleshooting checks on single-phase and three-phase compressor motors.</li> <li>• Under supervision, use a sealed tube acid/moisture test kit to test a system for the presence of acid and/or moisture.</li> <li>• Under supervision, remove and install a hermetic compressor.</li> <li>• Remove and install a valve plate assembly and head on a semi-hermetic compressor.</li> <li>• Adjust the cylinder unloader on a semi-hermetic compressor.</li> </ul>	<b>Week 14</b>
19.	<b>Overhaul retail refrigeration system</b>	<ul style="list-style-type: none"> <li>• Clean an ice machine.</li> <li>• Isolate faults in refrigeration and ice machines.</li> <li>• Set up an electric defrost schedule for a refrigeration appliance.</li> </ul>	<b>Week 15</b>
20.	<b>Perform Troubleshooting of Electronic components</b>	<ul style="list-style-type: none"> <li>• Develop a checklist for troubleshooting a microprocessor-controlled heating or cooling appliance.</li> <li>• Analyze circuit diagrams and other manufacturers' literature to determine the operating sequence of microprocessor-controlled systems.</li> <li>• Use test equipment to diagnose a microprocessor-controlled comfort system.</li> <li>• Isolate and correct malfunctions in a microprocessor-controlled heating appliance.</li> <li>• Isolate and correct malfunctions in a microprocessor-controlled cooling unit or heat pump.</li> </ul>	<b>Week 16</b>
21.	<b>Perform Troubleshooting of Heat Pumps</b>	<ul style="list-style-type: none"> <li>• Develop a checklist for troubleshooting a heat pump.</li> <li>• Analyze control circuit diagram(s) for a selected heat pump.</li> <li>• Isolate and correct malfunctions in a heat pump using the correct tools and instruments: <ul style="list-style-type: none"> <li>▪ Cooling function</li> <li>▪ Reverse cycle heating function</li> <li>▪ Defrost cycle</li> <li>▪ Auxiliary electric heat</li> </ul> </li> </ul>	<b>Week 17</b>
22.	<b>Interpret HVAC-related drawings</b>	<ul style="list-style-type: none"> <li>• Identify and interpret the following on an architectural drawing: <ul style="list-style-type: none"> <li>▪ Floor plans and details</li> <li>▪ Elevations</li> <li>▪ Foundation plan</li> <li>▪ Reflected ceiling plan</li> </ul> </li> <li>• Identify and interpret the following on a plumbing plan drawing: <ul style="list-style-type: none"> <li>▪ Sanitary plumbing plans</li> <li>▪ Domestic water plumbing plans</li> </ul> </li> </ul>	<b>Week 18</b>

		<ul style="list-style-type: none"> <li>▪ Isometric views</li> <li>▪ Riser diagrams</li> <li>▪ Schedules</li> <li>▪ Specification references</li> <li>▪ Legends</li> <li>• Identify and interpret the following on a mechanical plan drawing: <ul style="list-style-type: none"> <li>▪ Hot- and chilled-water coil piping</li> <li>▪ HVAC piping</li> <li>▪ Chiller piping/installation</li> <li>▪ Refrigeration piping schematics</li> <li>▪ Air handling unit installation/connecting ductwork</li> <li>▪ Hot- and chilled-water flow diagrams</li> <li>▪ Schedules</li> <li>▪ Specification references</li> <li>▪ Legends</li> </ul> </li> <li>• Identify and interpret the following on an electrical plan drawing: <ul style="list-style-type: none"> <li>▪ Riser diagrams</li> <li>▪ Schedules</li> <li>▪ Specification references</li> <li>▪ Legends</li> </ul> </li> <li>• Prepare a request for information (RFI) form.</li> <li>• Identify and interpret the information given in the specifications pertaining to a construction project.</li> <li>• Mark up HVAC mechanical plans to show as-built modifications.</li> <li>• Perform an HVAC equipment and material takeoff and prepare the takeoff forms.</li> <li>• Prepare building coordination drawings that show the composite installation of HVAC equipment relative to the equipment installed by other trades, such as the electrical and plumbing trades.</li> </ul>	
23.	<p><b>Estimate the heating and/or cooling load of a building</b></p>	<ul style="list-style-type: none"> <li>• Identify and describe the steps in the system design process.</li> <li>• From construction drawings or an actual job site, obtain information needed to complete heating and cooling load estimates.</li> <li>• Identify the factors that affect heat gains and losses to a building and describe how these factors influence the design process.</li> <li>• State the principles that affect the selection of equipment to satisfy the calculated heating and/or cooling load.</li> <li>• With instructor supervision, select heating and/or cooling equipment using manufacturers' product data.</li> <li>• Identify the various types of duct systems and explain why and where each type is used.</li> <li>• Demonstrate the effect of fittings and transitions on duct system design.</li> <li>• Use a friction loss chart and duct sizing table to size duct.</li> <li>• Install insulation and vapor barriers used in duct systems.</li> <li>• Following proper design principles, select and install refrigerant and condensate piping.</li> <li>• Estimate the electrical load for a building and calculate the effect of the comfort system on the electrical load.</li> </ul>	<p><b>Week 19</b></p>

24.	<b>Install Commercial and Industrial Refrigeration Systems</b>	<ul style="list-style-type: none"> <li>• Install a packaged condensing unit and/or individual air-cooled condenser in a refrigeration system.</li> <li>• Install a packaged unit cooler and/or individual evaporator in a refrigeration system.</li> <li>• Install two to three selected refrigeration system accessories.</li> <li>• From a selection provided by the instructor, identify the following control devices commonly used in refrigeration systems: <ul style="list-style-type: none"> <li>▪ Crankcase pressure regulator</li> <li>▪ Evaporator pressure regulator</li> <li>▪ Condenser head pressure regulator</li> <li>▪ Hot gas bypass regulator</li> <li>▪ Compressor cylinder unloader</li> <li>▪ Solenoid-controlled unloader</li> </ul> </li> </ul>	<b>Week 20</b>
25.	<b>Build your CV</b>	<p>Download professional CV template from any good site (<a href="https://www.coolfreecv.com">https://www.coolfreecv.com</a> or relevant)</p> <ul style="list-style-type: none"> <li>• Add Personal Information</li> <li>• Add Educational details</li> <li>• Add Experience/Portfolio</li> <li>• Add contact details/profile links</li> </ul>	<b>Week 21-26</b>
26.	<b>Create an account profile on Fiverr (at least two gigs) and Up-work</b>	<p>Create an account by following these steps:</p> <p><b>Step 1:</b> Personal Info</p> <p><b>Step 2:</b> Professional Info</p> <p><b>Step 3:</b> Linked Accounts</p> <p><b>Step 4:</b> Account Security</p>	<b>Week 21-26</b>
27.	<b>How to search and apply for jobs in at least two labor marketplace countries (KSA, UAE, etc.)</b>	<ul style="list-style-type: none"> <li>• Browse the following website and create an account on each website <ul style="list-style-type: none"> <li>▪ Bayt.com – The Middle East Leading Job Site</li> <li>▪ Monster Gulf – The International Job Portal</li> <li>▪ Gulf Talent – Jobs in Dubai and the Middle East</li> </ul> </li> <li>• Find the handy ‘search’ option at the top of your homepage to search for the jobs that best suit your skills.</li> <li>• Select the job type from the first ‘Job Type’ drop-down menu, next, select the location from the second drop-down menu.</li> <li>• Enter any keywords you want to use to find suitable job vacancies.</li> <li>• On the results page you can search for part-time jobs only, full-time jobs only, employers only, or agencies only. Tick the boxes as appropriate to your search.</li> <li>• Search for jobs by: <ul style="list-style-type: none"> <li>▪ Company</li> <li>▪ Category</li> </ul> </li> </ul>	<b>Week 21-26</b>

		<ul style="list-style-type: none"><li>▪ Location</li><li>▪ All jobs</li><li>▪ Agency</li><li>▪ Industry</li></ul>	
--	--	---	--

## **HVAC**

---

**What is freelancing and how you can make money online - BBCURDU**

**<https://www.youtube.com/watch?v=9jCJN3Ff0kA>**

**What Is the Role of Good Manners in the Workplace? By Qasim Ali Shah | In Urdu**

**<https://www.youtube.com/watch?v=Qi6Xn7yKIIQ>**

**Hisham Sarwar Motivational Story | Pakistani Freelancer**

**[https://www.youtube.com/watch?v=CHm\\_BH7xAXk](https://www.youtube.com/watch?v=CHm_BH7xAXk)**

**21 Yr Old Pakistani Fiverr Millionaire | 25-35 Lakhs a Month Income | Interview**

**<https://www.youtube.com/watch?v=9WrmYYhr7S0>**

**Success Story of a 23 Year - Old SEO Expert | How This Business Works | Urdu Hindi Punjabi**

**<https://www.youtube.com/watch?v=tlQ0CWgszI0>**

**Failure to Millionaire - How to Make Money Online | Fiverr Superhero Aaliyaan Success Story**

**<https://www.youtube.com/watch?v=d1hocXWSpus>**

**Women Of HVAC, Success Story Karina Capos**

**<https://web.facebook.com/watch/?v=624561174776803>**

**Success Story: Sandra Garza**

**<https://web.facebook.com/watch/?v=441100533084944>**

## Annexure-II

### SUGGESTIVE FORMAT AND SEQUENCE ORDER OF MOTIVATIONAL LECTURE.

#### Mentor

Mentors are provided an observation checklist form to evaluate and share their observational feedback on how students within each team engage and collaborate in a learning environment. The checklist is provided at two different points: Once towards the end of the course. The checklists are an opportunity for mentors to share their unique perspective on group dynamics based on various team activities, gameplay sessions, pitch preparation, and other sessions, giving insights on the nature of communication and teamwork taking place and how both learning outcomes and the student experience can be improved in the future.

#### Session- 1 (Communication):

Please find below an overview of the activities taking place Session plan that will support your delivery and an overview of this session's activity.

Session- 1 OVERVIEW
Aims and Objectives:
<ul style="list-style-type: none"> <li>To introduce the communication skills and how it will work</li> <li>Get to know mentor and team - build rapport and develop a strong sense of a team</li> <li>Provide an introduction to communication skills</li> <li>Team to collaborate on an activity sheet developing their communication, teamwork, and problem-solving</li> <li>Gain an understanding of participants' own communication skills rating at the start of the program</li> </ul>

Activity:	Participant Time	Teacher Time	Mentor Time
Intro Attend and contribute to the scheduled.			
Understand good communication skills and how it works.			
Understand what good communication skills mean			
Understand what skills are important for good communication skills			
<b>Key learning outcomes:</b>	<b>Resources:</b>		<b>Enterprise skills developed:</b>
• Understand the	• Podium		• Communication

<p>communication skills and how it works.</p> <ul style="list-style-type: none"> <li>• Understand what communication skills mean</li> <li>• Understand what skills are important for communication skills</li> </ul>	<ul style="list-style-type: none"> <li>• Projector</li> <li>• Computer</li> <li>• Flip Chart</li> <li>• Marker</li> </ul>	<ul style="list-style-type: none"> <li>• Self Confidence</li> <li>• Teamwork</li> </ul>
--	---	---

<b>Schedule</b>	<b>Mentor Should do</b>
<p><b>Welcome:</b> <b>5 min</b></p>	<p>Short welcome and ask the <b>Mentor</b> to introduce him/herself. Provide a brief welcome to the qualification for the class. Note for Instructor: Throughout this session, please monitor the session to ensure nothing inappropriate is being happened.</p>
<p><b>Icebreaker:</b> <b>10 min</b></p>	<p>Start your session by delivering an icebreaker, this will enable you and your team to start to build rapport and create a team presentation for the tasks ahead. The icebreaker below should work well at introductions and encouraging communication, but feel free to use others if you think they are more appropriate. It is important to encourage young people to get to know each other and build strong team links during the first hour; this will help to increase their motivation and communication throughout the sessions.</p>
<p><b>Introduction &amp; Onboarding:</b> <b>20mins</b></p>	<p>Provide a brief introduction of the qualification to the class and play the “Onboarding Video or Presentation”. In your introduction cover the following:</p> <ol style="list-style-type: none"> <li>1. Explanation of the program and structure. (Kamyab jawan Program)</li> <li>2. How you will use your communication skills in your professional life.</li> <li>3. Key contacts and key information – e.g. role of teacher, mentor, and SEED. Policies and procedures (user agreements and “contact us” section). Everyone to go to the Group Rules tab at the top of their screen, read out the rules, and ask everyone to verbally agree. Ensure that the consequences are clear for using the platform outside of hours. (9am-8pm)</li> <li>4. What is up next for the next 2 weeks ahead so young people know what to expect (see pages 5-7 for an overview of the challenge). Allow young people to ask any questions about the session topic.</li> </ol>
<p><b>Team Activity Planning:</b> <b>30 minutes</b></p>	<p>MENTOR: Explain to the whole team that you will now be planning how to collaborate for the first and second collaborative Team Activities that will take place outside of the session. There will not be another session until</p>

	<p>the next session so this step is required because communicating and making decisions outside of a session requires a different strategy that must be agreed upon so that everyone knows what they are doing for this activity and how.</p> <ul style="list-style-type: none"> <li>• “IDENTIFY ENTREPRENEURS” TEAM ACTIVITY</li> <li>• “BRAINSTORMING SOCIAL PROBLEMS” TEAM ACTIVITY”</li> </ul> <p><i>As a team, collaborate on a creative brainstorm on social problems in your community. Vote on the areas you feel most passionate about as a team, then write down what change you would like to see happen.</i></p> <p>Make sure the teams have the opportunity to talk about how they want to work as a team through the activities e.g. when they want to complete the activities, how to communicate, the role of the project manager, etc.</p> <p>Make sure you allocate each young person a specific week that they are the project manager for the weekly activities and make a note of this.</p> <p>Type up notes for their strategy if this is helpful - it can be included underneath the Team Contract.</p>
<p><b>Session Close:</b> <b>5 minutes</b></p>	<p><b>MENTOR:</b> Close the session with the opportunity for anyone to ask any remaining questions.</p> <p><b>Instructor:</b> Facilitate the wrap-up of the session. A quick reminder of what is coming up next and when the next session will be.</p>

## MOTIVATIONAL LECTURES LINKS.

<b>TOPIC</b>	<b>SPEAKER</b>	<b>LINK</b>
How to Face Problems In Life	Qasim Ali Shah	<a href="https://www.youtube.com/watch?v=OrQte08MI90">https://www.youtube.com/watch?v=OrQte08MI90</a>
Just Control Your Emotions	Qasim Ali Shah	<a href="https://www.youtube.com/watch?v=JzFs_yJt-w">https://www.youtube.com/watch?v=JzFs_yJt-w</a>
How to Communicate Effectively	Qasim Ali Shah	<a href="https://www.youtube.com/watch?v=PhHAQEGehKc">https://www.youtube.com/watch?v=PhHAQEGehKc</a>
Your ATTITUDE is Everything	Tony Robbins Les Brown David Goggins Jocko Willink Wayne Dyer Eckart Tolle	<a href="https://www.youtube.com/watch?v=5fS3rj6eIFg">https://www.youtube.com/watch?v=5fS3rj6eIFg</a>
Control Your EMOTIONS	Jim Rohn Les Brown TD Jakes Tony Robbins	<a href="https://www.youtube.com/watch?v=chn86sH0O5U">https://www.youtube.com/watch?v=chn86sH0O5U</a>
Defeat Fear, Build Confidence	Shaykh Atif Ahmed	<a href="https://www.youtube.com/watch?v=s10dzfbozd4">https://www.youtube.com/watch?v=s10dzfbozd4</a>
Wisdom of the Eagle	Learn Kurooji	<a href="https://www.youtube.com/watch?v=bEU7V5rJTtw">https://www.youtube.com/watch?v=bEU7V5rJTtw</a>
The Power of ATTITUDE	Titan Man	<a href="https://www.youtube.com/watch?v=r8LJ5X2ejqU">https://www.youtube.com/watch?v=r8LJ5X2ejqU</a>
STOP WASTING TIME	Arnold Schwarzenegger	<a href="https://www.youtube.com/watch?v=kzSBrJmXqdg">https://www.youtube.com/watch?v=kzSBrJmXqdg</a>
Risk of Success	Denzel Washington	<a href="https://www.youtube.com/watch?v=tbnzAVRZ9Xc">https://www.youtube.com/watch?v=tbnzAVRZ9Xc</a>

**SUCCESS STORY**

S. No	Key Information	Detail/Description
1.	<b>Self &amp; Family background</b>	<p><b>Danyal Saleem</b>, who lives in Mirpur (AJK), is an example of how hard work and perseverance can reap rich rewards when bidding for projects online. The graphic designer works exclusively on an online freelancing platform and has earned, on average, <b>US\$20,000</b> per month for the past several months. But this isn't a story of overnight success – Danyal has had to work hard to differentiate himself and stay true to his goal.</p> <p>It was a full year later, in May 2017, when Danyal finally decided to jump in. He signed up for one of the numerous sites that connect designers or coders with people or companies that have small projects, like designing a logo or building a website. He had already started a small business to help pay for his college education, so he was nervous and apprehensive about the decision. “I gave myself two or three months at most. If I didn't succeed, then I would go back to running the business as it was showing potential,” he says.</p> <p><b>If at first, you don't succeed, try try again</b></p>
2.	<b>How he came on board NAVTTC Training/ or got trained through any other source</b>	Certification in graphic designing from STEPS(NAVTTC partner institute)
3.	<b>Post-training activities</b>	<p><b>Danyal's</b> area of expertise is in <b>graphic design</b>. In his first month using Fiverr, he pitched mostly for projects centered around logo designing. But it wasn't so simple. In the first few weeks, he didn't hear back from even a single client, despite pitching for dozens of projects.</p> <p>“I needed to understand what worked, so I read blogs, participated in forums, and analyzed profiles of successful freelancers. It was an uphill struggle, but I didn't want to give up,” he explains.</p> <p>Danyal says he understands why clients would be apprehensive giving projects to untested freelancers. They have hundreds of options to choose from, he</p>

		<p>explains, and to give a project to someone with no experience requires a strong leap of faith.</p> <p>A slow stream of projects started to come Danyal's way. Within a few months, he was landing an average of a hundred projects every month, with a large number of repeat clients. He also expanded the range of his professional services, branching out from logo design to business cards, banners, Facebook cover pages, letterheads, and stationery.</p> <p>But he's had to face his fair share of challenges too. The shoddy state of internet infrastructure in his city, Mirpur, threatened to derail his freelancing career. "Sometimes I haven't had connectivity for two days straight," he explains. "That's unthinkable for someone who makes his livelihood on the internet."</p>
4.	<p><b>Message to others</b> <b>(under training)</b></p>	<p>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.</p>

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

1. To call a passed out successful trainee of the institute. He will narrate his success story to the trainees in his own words and meet trainees as well.
2. To see and listen to a recorded video/clip (5 to 7 minutes) showing a successful trainee 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, etc) and narrates his/her story in the teacher's own motivational words.

\* *The online success stories of renowned professional can also be obtained from **Annex-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 the importance of work and manifested by determination or desire to work hard.

The following ten work ethics are defined as essential for student 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 weight and help others who are struggling. Recognize when to speak up with an idea 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 lifetime

**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. Take 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 work 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.