

Government of Pakistan

National Vocational and Technical Training Commission

Prime Minister's Hunarmand Pakistan Program

"Skills for All"



Course Contents / Lesson Plan

Course Title: Plastic Injection Molding Machine Operator

Duration: 6 Months

Revised Edition

Trainer Name	
Course Title	Plastic Injection Molding Machine Operator
Objectives and Expectations	<p>Employable skills and hands-on practice for Plastic Injection Molding Machine Operator</p> <p>This course offers a broad, cross-disciplinary learning experience for students looking to pursue career as a Plastic Injection Molding Machine Operator. The needs for superior 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 being a Plastic Injection Molding Machine Operator and allied technologies.</p> <p><u>Main Expectations:</u></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>ii. To materialize the main expectations, a special module on <u>Job Search & Entrepreneurial Skills</u> has been included in the latter part of this course (5th & 6th 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>iii. A module on Work Place Ethics 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 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: -

	<ol style="list-style-type: none"> 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)
Entry-level of trainees	Intermediate
Learning Outcomes of the course	<p>By the end of this course, students will be able to:</p> <ul style="list-style-type: none"> • Be able to recognize the dangers and observe relevant safety precautions while performing / supervising hot work. • Understand the differences and working principles of various Injection moulding equipment on board. • Troubleshoot injection moulding machine. • Troubleshoot for moulding faults and analyse for causes and provide remedies • Basic operation of hydraulic and pneumatic systems • Classify different mould fitting adjustment • Operation & control of PLC operated IMM • Test various properties & identify plastic using 7 QC tools
Course Execution Plan	<p>The total duration of the course: 6 months (26 Weeks) Class hours: 4 hours per day Theory: 20% Practical: 80% Weekly hours: 20 hours per week Total contact hours: 520 hours</p>
Companies offering jobs in the respective trade	<ol style="list-style-type: none"> 1. Techpro Industries Private Limited, Taxila 2. Lucky Plastic Industries Pvt Ltd, Lahore 3. Engi Plastic Industries Lahore 4. HI TECH Plastics Engineering 5. Borche Injection Molding Machinery Pakistan 6. PolyPlast Custom Moulders PCM 7. Sakura Group Of Companies 8. Innovative Manufacturing Industries
Job Opportunities	<p>Can join industry as Technician and will progress further as Senior Technician, Supervisor and can rise up to the level of Manager. Can become Entrepreneur in the related field. Can join Apprenticeship programs in different types of industries</p>
No of Students	25
Learning Place	Classroom / Lab
Instructional Resources	<ol style="list-style-type: none"> 1. Injection molding theory and practice by I Rubin. 2. Plastics material and processes by Schwartz and Goodman. 3. A Guide to Injection Molding of plastics by Bolur. 4. Plastic engineering Handbook by Jeol Frados. 5. Injection molding machine by Johannaber. 6. Injection molding machine by Wheelen

MODULES

Scheduled Weeks	Module Title	Learning Units	Remarks
Week 1	Understand the basic Engineering practice and Introduction	<ul style="list-style-type: none"> • Motivational Lecture (<i>For further detail please see Page No: 3& 4</i>) • Job market • Course Applications • Institute/work ethics • Identify and describe personal protective equipment (PPE) related to the Injection Moulding Machine <ul style="list-style-type: none"> ▪ Identify and describe body, foot, and hand protective gear. ▪ Identify and describe ear, eye, face, and head protective gear. • Identify and describe Injection Moulding Machine safety practices related to specific hazards or environments. 	<p>Home Assignment</p> <ul style="list-style-type: none"> • Task 1 • Task 2 • Task 3 <p><i><u>Details may be seen at Annexure-I</u></i></p>
Week 2	Measuring, Cutting and finishing tools	<ul style="list-style-type: none"> • Success stories (<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Importance of trade. • Importance of safety & Rules. • Classes of fire extinguishers. • Introduction about occupational health hazards followed in plastic industries • Linear measuring Tools (steal rule) • Hand Tools • Marking Tools • Punching Tools • Sawing Tools • Files • Description Types grades & cut 	<ul style="list-style-type: none"> • Task 4 <p><i><u>Details may be seen at Annexure-I</u></i></p>
Week 3	Drilling, Tapping, Dieing	<ul style="list-style-type: none"> • Motivational Lecture(<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Drilling machine and its types • Drilling machines its parts and functions • Types of drill • Operation Done of Drilling machine • Tool's used in internal threading Tap & Tap wrench • Tools used in external threading Die& Diestock • Introduction to precision measuring instruments 	<ul style="list-style-type: none"> • Task 5 <p><i><u>Details may be seen at Annexure-I</u></i></p>

		<ul style="list-style-type: none"> • Vernier caliper • Micrometer • Height gauge • Bevel protector • Least count calculation and it's measurements • Locking devices. 	
Week 4	Basic electrical Earthings	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to learn:</p> <ul style="list-style-type: none"> • Definition of Electrical Quantities and its Units • Ohm's law • Types of circuits and its connections • Types of Fuses • Types of Earthing • Wire & cable • Electric Symbol's 	<ul style="list-style-type: none"> • Task 6 <p><u>Details may be seen at Annexure-I</u></p> <p>Monthly Test</p>
Week 5	Plastic materials and properties	<ul style="list-style-type: none"> • Motivational Lecture(For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Introduction of plastic • Group of plastic • Properties and used of • Thermoplastic materials • PE *PP * PVC * PMMA * SAN* PC* Nylon * PET. • Properties and Uses of Thermosetting materials *PF* UF* MF* EPOXY* Polyester resin (SMC/DMC) • Identification of plastic. 	<ul style="list-style-type: none"> • Task 7 <p><u>Details may be seen at Annexure-I</u></p>
Week 6	Injection moulding items and defects	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Different processing techniques • Classification of Injection moulding machine • Hand injection moulding machine parts and function • Injection moulding cycle • Moulds used in hand injection moulding machine and its terms • Faults, causes and its remedies in hand injection moulding process. Basic knowledge of mould • Core • Cavity 	<ul style="list-style-type: none"> • Task 8 <p><u>Details may be seen at Annexure-I</u></p>

		<ul style="list-style-type: none"> • Cooling channel • Ejection system • Runner • Gate 	
Week 7	Automatic injection moulding machine	<ul style="list-style-type: none"> • Motivational Lecture(<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Auto injection moulding machine its parts and functions • Screw type injection moulding machine • Plunger type injection moulding machine • Co-injection • Different type of clamping system • Auto injection moulding machine mould its parts and function • Two plate mould & three plate mould. Hot Runner mould • Processing defects causes and Remedies –(product) • Trouble shooting of injection molding machine. 	<ul style="list-style-type: none"> • Task 9 <p><i>Details may be seen at <u>Annexure-I</u></i></p>
Week 8	Automatic injection moulding machine and Microprocessor control and PLC	<ul style="list-style-type: none"> • Success stories (<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Advantage of Microprocessor and PLC • Electrical injection moulding machines. • Basic principles and feature of thermo set injection moulding process • Comparison between conventional injection moulding machine and PLC & microprocessor control injection moulding machine. 	<ul style="list-style-type: none"> • Task 10 <p><i>Details may be seen at <u>Annexure-I</u></i></p>
Week 9	Preventive maintenance of injection moulding machine	<ul style="list-style-type: none"> • Motivational Lecture(<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Importance of preventive maintenance • Schedule wise preventive maintenance of injection moulding machine • Introduction about hydraulic system. • Pascal's law. • Different hydraulic component and it function. • Hydraulic symbol's of component. 	<ul style="list-style-type: none"> • Task 11 <p><i>Details may be seen at <u>Annexure-I</u></i></p>

Week 10	Compression moulded items and defects	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Processing techniques used for thermo set materials • Introducing about compression moulding process • Machinery used for compression moulding process. • Hand compression moulding machine parts and function • Faults causes and remedies of product. 	<p style="text-align: center;">• Task 12</p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>
Week 11	Semi- auto compression moulding machine	<ul style="list-style-type: none"> • Motivational Lecture (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Introduction about semi-auto compression moulding machine. • Semi-auto compression moulding machine parts and function. • Heating system used for mould. • Different types of compression mould • Faults, causes, remedies of processing • Trouble shooting of compression moulding machine • Introduction about transfer moulding process 	<p style="text-align: center;">• Task 13</p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>
Week 12	Blow moulding items and finished product inspection	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Introduction to blow moulding process. • List the blow moulding techniques. • Explain parts and functions of hand blow moulding machine. • Faults, causes & Remedies of hand blow moulding. 	<p style="text-align: center;">• Task 14</p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>
Week 13	Midterm		
Week 14	Pneumatic circuits	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Introduction about pneumatic system. • Different pneumatic component and its function. • Pneumatics symbols of component. 	<p style="text-align: center;">• Home Assignment</p> <p style="text-align: center;">• Task 15</p> <p style="text-align: center;"><u>Details may be seen at Annexure-I</u></p>

<p>Week 15</p>	<p>Set and operate the blown film plant</p>	<ul style="list-style-type: none"> • Motivational Lecture (<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Auto blow moulding machine parts and functions. • cycle of Auto blow moulding process. • Different types of blow moulds and its nomenclature. • Stretch blow moulding process. • Other blow moulding techniques. (Extrusion stretch blow (injection stretch blow extrusion blow, intermittent blow, injection blow). • Faults, causes remedies of blow moulding. • Preventive maintenance of low moulding machine. • Required PPE • Introduction to extrusion process. • Materials used for extrusion. • Latest extrusion techniques – (multilayer co-extruder, corrugated pipes.) • Extrusion machine its description use different parts & function. • Blown film extrusion. • Fault, causes Remedies of Blown film. 	<ul style="list-style-type: none"> • Task 16 <p><u>Details may be seen at Annexure-I</u></p>
<p>Week 16</p>	<p>Operate the pipe plant and produce good quality pipe</p>	<ul style="list-style-type: none"> • Success stories (<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • PVC compounding and its chemical ingredients • Pipe plant extrusion its units and function • Fault, causes, Remedies of pipe. 	<ul style="list-style-type: none"> • Task 17 <p><u>Details may be seen at Annexure-I</u></p>
<p>Week 17</p>	<p>Operate the reprocessing plant and produce reprocessed granules</p>	<ul style="list-style-type: none"> • Motivational Lecture (<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Reprocessing of plastic. • Scrap grinder parts & function & its specification. • Identification code Number for different plastics and its use. • Description about extrusion dies & its parts. 	<ul style="list-style-type: none"> • Task 18 <p><u>Details may be seen at Annexure-I</u></p>

Week 18	Thermoforming machine and defects	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Introduction thermoforming process. • Thermoforming cycle. • Materials for thermoforming. • Mould materials. • Heating systems. 	<ul style="list-style-type: none"> • Task 19 <p><u>Details may be seen at Annexure-I</u></p> <ul style="list-style-type: none"> • Monthly Test
Week 19	Predrying process using different materials	<ul style="list-style-type: none"> • Motivational Lecture (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Importance of pre-drying. • Various pre-drying equipments. • Pre-drying temperature and time for various materials. • Safety observed while operating pre-drying equipment 	<ul style="list-style-type: none"> • Task 20 <p><u>Details may be seen at Annexure-I</u></p>
Week 20	Machining operations on plastic sheets/blocks	<ul style="list-style-type: none"> • Success stories (For further detail please see Page No: 3& 4) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • Methods of joining & assembly • Buffing & sanding. • Methods of machining of plastics. • Decoration of plastics. 	<ul style="list-style-type: none"> • Task 21 <p><u>Details may be seen at Annexure-I</u></p>
Week 21	Employable Project/ Assignment (6 weeks) i.e. 21-26 besides regular classes. OR On the job training (2 weeks)	<ul style="list-style-type: none"> • Guidelines to the Trainees for selection of students employable project like final year project (FYP) • Assign Independent project to each Trainee • A project-based on trainee's aptitude and acquired skills. • Designed by keeping in view the emerging trends in the local market as well as across the globe. • The project idea may be based on Entrepreneur. • Leading to successful employment. • The duration of the project will be 6 weeks • Final viva/assessment will be conducted on project assignments. • At the end of the session, the project will be presented in a skills competition • The skill competition will be conducted on zonal, regional, and National levels. 	Monthly Test

		<ul style="list-style-type: none"> • The project will be presented in front of Industrialists for commercialization • The best business idea will be placed in the NAVTTC business incubation center for commercialization. <p style="text-align: center;">OR</p> <p>On the job training for 2 weeks:</p> <ul style="list-style-type: none"> • Aims to provide 2 weeks of industrial training to the Trainees as part of the overall training program • Ideal for the manufacturing trades • As an alternative to the projects that involve expensive equipment • Focuses on increasing Trainee's motivation, productivity, efficiency, and quick learning approach. 	
Week 22	Capstone Project	<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"> 1. Design brief/description outlining their project 2. Research collected during the project 3. Rough sketches, either hand-drawn or digitally created that showcase their design process 4. Professionally presented a main body of artwork at the end of the course <p>Notes for the Trainer/Teacher:</p> <ul style="list-style-type: none"> • 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. • Each project should be designed keeping future design trends as well as current market demands in mind • The duration for the completion of the project is 4 weeks <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</p>	

		<p>different sites such as: https://1000projects.org/ https://www.freestudentprojects.com/</p>	
Week 23	Introduction to Freelancing	<ul style="list-style-type: none"> • Motivational Lecture(<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • the concept of freelancing • how to become freelance and create a sustainable income • pros and cons of freelancing • the ethical and professional way of becoming a productive freelancer • resources available for freelancing in the field of design • how to join freelancing sites • the process of creating a freelancing profile 	
Week 24	Professional practice methods& legal side of design	<ul style="list-style-type: none"> • Success stories (<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • the standards that define the expectations of a professional welder • the principles of integrity that demonstrate respect for the profession, for colleagues, for clients, for audiences or consumers, and society as a whole • the perspectives of the said profession i.e. understanding the profession, the meanings of environmental responsibility, copyright, and ethics • what legalities are involved in professional projects • how to build strong professional proposals • copyrights, copyright infringement, plagiarism, crediting creators, purchasing online products, downloading 'free' content • the do's and don'ts of how to price their time, effort, and creativity 	
Week 25	Preparing your portfolio	<ul style="list-style-type: none"> • Motivational Lecture(<i>For further detail please see Page No: 3& 4</i>) <p>Students are introduced to:</p> <ul style="list-style-type: none"> • the concept of design portfolios • the concept of present design work/projects in a professional manner • websites that provide free portfolio hosting such as Behance and Dribble 	Final Assessment

		<ul style="list-style-type: none"> • creating a portfolio • how to select work for presenting in your portfolio 	
Week 26	Entrepreneurship and Final Assessment in project	<ul style="list-style-type: none"> • Success stories (<i>For further detail please see Page No: 3& 4</i>) • Job Market Searching • Self-employment • Introduction • Fundamentals of Business Development • Entrepreneurship • Startup Funding • Business Incubation and Acceleration • Business Value Statement • Business Model Canvas • Sales and Marketing Strategies • How to Reach Customers and Engage • Stakeholders Power Grid • RACI Model, SWOT Analysis, PEST Analysis • SMART Objectives • OKRs • Cost Management (OPEX, CAPEX, ROCE, etc.) • Final Assessment 	

Tasks For Certificate in Plastic Injection Moulding Machine Operator

Task No.	Task	Description	Week
1.	Find the career path	<ul style="list-style-type: none"> Prepare a career path related to your course and also highlight the emerging trends in the local as well as international market 	Week 1
2.	Work Ethics	<ul style="list-style-type: none"> Generate a report on Institute work ethics and professionalism related to your course 	
3.	Identify hazards in workshop	<ul style="list-style-type: none"> Prepare a report of at least 10 safety practices and Plastic Injection Molding Machine related hazards. 	
4.	Check and perform measuring, marking, Hack sawing, filling by using various measuring, marking, cutting and finishing tools following safety precautions	<ul style="list-style-type: none"> Identification to safety equipment & their use etc. General safety precautions while working in PPO section. Methods of Housekeeping. Use fire fighting equipments. Importance of trade training. Perform marking practice straight lines. Perform hack sawing. Fit hacksaw blade to frame. Use different types of hacksaws frames. Perform filling practice - (straights, cross a draw). Check flatness. Check right angle. Check overall dimensions with vernier calliper. Check overall dimensions with vernier height gauge 	Week-2
5.	Check and perform drilling, tapping, dieing by using different related tools	<p>Drilling Practice</p> <ul style="list-style-type: none"> Identify of different parts of drilling machine. Fit the tool on drilling machine Set the job on machine table with machine vice. Perform drilled hole. Perform blind hole. Perform counter sunked hole. Perform counter boring hole. Perform spot facing with drilling machine. Inspect hole diameters with the help of vernier caliper. <p>Tapping practice</p> <ul style="list-style-type: none"> Illustrate tapping tools (Tap set and Tap wrench). Perform tapping practice with Tap set. <p>Dieing practice</p> <ul style="list-style-type: none"> Illustrate dieing Tools (Die & Diestock). Perform dieing practice with Die. Inspect outside diameters with the help of outside micrometer. 	Week 3

6.	Test and Perform basic electrical earthings with the accessories fittings on board	<ul style="list-style-type: none"> • Perform circuits (close open short). • Verify Ohm's law. • Perform series circuits. • Perform parallel circuits. • Perform compound circuits. • Do earthing & test • Fix the accessories one electric board. 	Week 4
7.	Identify different plastic materials and test the properties of material by using various test apparatus	<ul style="list-style-type: none"> • Identify plastic (Thermoplastic / Thermoset) • Perform Tensile Testing. • Perform Compression Test. • Perform Shear test. • Perform Hardness Test. • Perform Melting point Test. • Perform Impact Test. • Perform Cup flow Testing. • Perform Water absorption Testing. • Perform Haze, gloss testing. • Perform Dart impact Testing. 	Week 5
8.	Identify, set and produce good quality of injection moulding items and check the defects	<ul style="list-style-type: none"> • Identify different parts of Hand injection moulding machine. • Perform Mould setting. • Loading • Perform mould • Loading mould cooling connection • Purging of screw and bearing • Pre-drying requirement • Set Temperature. • Perform IRO. • Perform TRO - Single cavity mould. • Perform TRO- Double cavity mould. • Do preventive maintenance of Hand injection moulding machine. 	Week 6
9.	Automatic injection moulding machine	<ul style="list-style-type: none"> • Identify of different parts of Automatic injection moulding machine (parts & function). • Perform Mould setting. • Read and set the pressure gauges. • Read and set temperature. • Perform IRO- (start-up, cycle and shutdown procedure). • Perform TRO- single cavity / double cavity mould. • Inspect quality (visuals). • Do preventive maintenance of auto injection moulding machine. 	Week 7
10.	Identify, set, maintain and produce good quality of injection moulding items by using automatic injection moulding machine with the application of Microprocessor	<ul style="list-style-type: none"> • Identify and list out of microprocessor control process parameters. • Read and study of process parameters. • Perform mould setting. • Mould loading • Cooling / MTC • Hot runner system • Ejection 	Week 8

	control and PLC	<ul style="list-style-type: none"> • Perform Injection unit setting. • Perform different pressure setting. • Set the temperature. • Perform IRO. • Set the shot weight. • Perform TRO. • Shoot out troubles of processing. • Perform mould unloading • Perform mould loading. • Housekeeping of mould. • Trouble shooting of machine. 	
11.	Preventive maintenance of injection moulding machine	<ul style="list-style-type: none"> • Do over all cleaning. • Do PM of electrical accessories. • Do PM of hydraulic accessories • Identify hydraulic component. • Make hydraulic circuits using single acting cylinder, flow control valve, pressure control valve and pump. • Make hydraulic circuits using double acting cylinder, flow control, pressure control valve pump. 	Week 9
12.	Produce good quality of compression moulded items and check the defects by using compression moulding machine	<ul style="list-style-type: none"> • Identify of different part of the hand compression moulding machine. • Set the temperature on hand compression moulding machine. • Perform mould setting. • Perform TRO - hand compression. • Do preventive maintenance of hand compression. 	Week 10
13.	Semi- auto compression moulding machine	<ul style="list-style-type: none"> • Identify of different part of semi- auto compression moulding machine. • Illustrate hydraulic system of compression moulding machine. • Load the mould & set. • Set the temperature. • Perform IRO. • Perform TRO. • Do preventive maintenance of compression moulding machine. 	Week 11
14.	Identify and produce good quality of blow moulding items and inspect the finished product	<ul style="list-style-type: none"> • Identify different parts of hand blow moulding machine. • Set the temperature. • Operate the hand blow moulding machine (IRO). • Perform hand blow moulding machine (TRO). • Perform mould unloading. • Load the mould and set • Do preventive maintenance of hand blow moulding machine. 	Week 12
	Mid term		Week 13

15.	Perform simple pneumatic circuits	<ul style="list-style-type: none"> Identify pneumatic components. Perform pneumatic circuit using pneumatic components (use single acting cylinder) Perform pneumatic circuits using pneumatic components (use double acting cylinder) 	Week 14
16.	Identify different parts, set and operate the blown film plant	<ul style="list-style-type: none"> Identify of different parts of the Auto blow molding machine. Load the mould and set. Set the temperature. Perform IRO – auto blow. Set the parison. Set the parison wall thickness. Perform TRO – auto blows. Unload mould. Do preventive maintenance of auto blow moulding. Clean and inspect air compressor. Recognize the extruder. Identify of different parts of the control panels Set the processing temperature. Change the screw PVC to PE. Clean the breaker plate and change screen packs. Load the Blown film Die. Connect the heaters of Blown film Die. Adjust the screw speed Nip rollers & winding rollers. Perform TRO – (Blown film). 	Week 15
17.	Operate the pipe plant and produce good quality pipe	<ul style="list-style-type: none"> Unload blown film die. Load pipe die. Set the pipe plant. Change the screw (PE to PVC). Set the temperature for pipe processing. Perform TRO – (pipe). 	Week 16
18.	Operate the reprocessing plant and produce reprocessed granules	<ul style="list-style-type: none"> Load the reprocessing die on extruder. Prepare raw material for reprocessing. Illustrate the scrap grinder. Grind the scrap. Set the processing temperature for reprocessing. Perform TRO – (reprocessing of plastic). 	Week 17
19.	Install and Operate thermoforming machine and identify cycle of thermoforming Produce good quality of thermoforming product and check the defects	<ul style="list-style-type: none"> Demonstrate the thermoforming machine. Set the mould. Set the parameters of the thermoforming machine. (heat timer temperature, cooling system etc). Perform IRO – thermoforming machine. 	Week 18
20.	Identify and Perform	<ul style="list-style-type: none"> Illustrate pre-drying equipments. 	Week 19

	predrying process using different materials	<ul style="list-style-type: none"> • Set the temperature. • Load the material in tray. • Set the parameters and pre-dry the material. • Perform over all maintenance of pre-drying equipment. 	
21.	Carry out different machining operations on plastic sheets/blocks	<ul style="list-style-type: none"> • Illustrate the fabricating methods. • Cut the acrylic sheet using acrylic cutter. • Drill the acrylic sheet HDPE Block using hand drill machine. • Perform screwing the acrylic sheet. 	Week 20
22.	Build your CV	<p>Download professional CV template from any good site (https://www.coolfreecv.com or relevant)</p> <ul style="list-style-type: none"> • Add Personal Information • Add Educational details • Add Experience/Portfolio • Add contact details/profile links 	Week 21-26
23.	Create an account profile on Fiverr (at least two gigs) and Up-work	<p>Create an account by following these steps:</p> <p>Step 1: Personal Info Step 2: Professional Info Step 3: Linked Accounts Step 4: Account Security</p>	Week 21-26
24.	How to search and apply for jobs in at least two labor marketplace countries (KSA, UAE, etc.)	<ul style="list-style-type: none"> • Browse the following website and create an account on each website <ul style="list-style-type: none"> ▪ Bayt.com – The Middle East Leading Job Site ▪ Monster Gulf – The International Job Portal ▪ Gulf Talent – Jobs in Dubai and the Middle East • Find the handy ‘search’ option at the top of your homepage to search for the jobs that best suit your skills. • Select the job type from the first ‘Job Type’ drop-down menu, next, select the location from the second drop-down menu. • Enter any keywords you want to use to find suitable job vacancies. • 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. • Search for jobs by: <ul style="list-style-type: none"> ▪ Company ▪ Category ▪ Location ▪ All jobs ▪ Agency 	Week 21-26

Plastic Injection Moulding Machine Operator

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

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>

Success Story - (EN) improved production for Flaro Prod S.A with FANUC ROBOSHOT

<https://www.youtube.com/watch?v=R69xmONvmIY>

Plastics Injection Molding: Step-By-Step at the Factory - Field Notes

<https://www.youtube.com/watch?v=2qAnJy8x8WA>

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"> To introduce the communication skills and how it will work Get to know mentor and team - build rapport and develop a strong sense of a team Provide an introduction to communication skills Team to collaborate on an activity sheet developing their communication, teamwork, and problem-solving Gain an understanding of participants' own communication skills rating at the start of the program

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			
Key learning outcomes:	Resources:		Enterprise skills developed:
• Understand the	• Podium		• Communication

<p>communication skills and how it works.</p> <ul style="list-style-type: none"> • Understand what communication skills mean • Understand what skills are important for communication skills 	<ul style="list-style-type: none"> • Projector • Computer • Flip Chart • Marker 	<ul style="list-style-type: none"> • Self Confidence • Teamwork
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Schedule	Mentor Should do
<p>Welcome: 5 min</p>	<p>Short welcome and ask the Mentor 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>Icebreaker: 10 min</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>Introduction & Onboarding: 20mins</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"> 1. Explanation of the program and structure. (Kamyab jawan Program) 2. How you will use your communication skills in your professional life. 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) 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.
<p>Team Activity Planning: 30 minutes</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"> • “IDENTIFY ENTREPRENEURS” TEAM ACTIVITY • “BRAINSTORMING SOCIAL PROBLEMS” TEAM ACTIVITY” <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>Session Close: 5 minutes</p>	<p>MENTOR: Close the session with the opportunity for anyone to ask any remaining questions.</p> <p>Instructor: 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.

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

SUCCESS STORY

S. No	Key Information	Detail/Description
1.	Self & Family background	<p>Danyal Saleem, 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, US\$20,000 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>If at first, you don't succeed, try try again</p>
2.	How he came on board NAVTTC Training/ or got trained through any other source	Certification in graphic designing from STEPS(NAVTTC partner institute)
3.	Post-training activities	<p>Danyal's area of expertise is in graphic design. 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>Message to others (under training)</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.