CURRICULUM

FOR THE TRADE OF

MANUFACTURING ASSOCIATE – MODERN SHOPFLOOR ENGINEERING

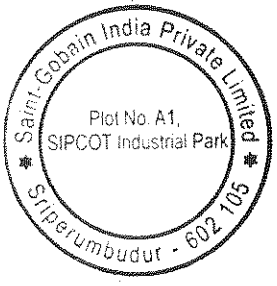
UNDER

NATIONAL APPRENTICE PROMOTION SCHEME

GOVERNMENT OF INDIA

MINISTRY OF SKILL DEVELOPMENT AND ENTREPRENEURSHIP

DIRECTORATE GENERAL OF TRAINING



1. **Category of trade** : Manufacturing Associate

2. **Name of the Trade** : **Manufacturing Associate** – Modern Shop Floor Engineering

3. **Duration of Apprenticeship Training** : **15 Months**

Break up of the Apprenticeship Training

(i) **Duration of Basic Training** : 3 Months / 600 Hrs

(ii) **Duration of Practical Training/ On-the-job Training** : 12 Months/ 2496 Hrs

4. **Entry Qualification** : Passed 10th Class

(A) <u>Basic training components</u>

(i)	Employability Skills	- 208 Hrs
(ii)	Basic Numeracy	- 38 Hrs
(iii)	Basic Electrical & Electronics	- 32 Hrs
(iv)	Trade Theory	- 180 Hrs
(v)	Trade Practical	- 110 Hrs
(vi)	Engineering Drawing	- 32 Hrs

Total Basic Training Hours - 600 Hrs

(B) Total Practical Training/On-the job training - 12 Months/ 2496 Hrs

(C) TOTAL HOURS - 3096 Hrs

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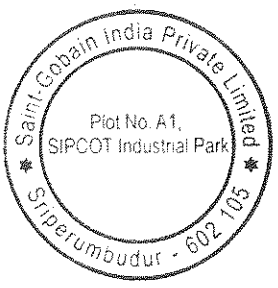
CONTENTS

1. ACKNOWLEDGEMENT

Nettur Technical Training Foundation (NTTF) sincerely acknowledges with thanks the contribution and cooperation extended by the Industry, CII , RDAT, State Directorates, Trade Experts and all others to bring out this curriculum for the trade of **Manufacturing Associate - Modern Shop floor Engineering** under Apprenticeship Training Scheme.

Special acknowledgement to Saint-Gobain India private limited who have contributed valuable inputs in bringing out this curriculum through their expert members.



2. BACKGROUND

Make in India

Make in India is a major national programme of the Government of India designed to facilitate investment, foster innovation, enhance skill development, protect intellectual property and build best in class manufacturing infrastructure in the country. The primary objective of this initiative is to attract investments from across the globe and strengthen India's manufacturing sector. The Make in India programme is very important for the economic growth of India as it aims at utilising the existing Indian talent base, creating additional employment opportunities and empowering secondary and tertiary sector. The programme also aims at improving India's rank on the Ease of Doing Business index apart from skilled workforce & infrastructure by making bureaucratic processes easier and providing an online platform thus making it transparent, responsive and accountable.

Skill India

Skills and knowledge are the driving forces of economic growth and social development of any country.

- India is one of the youngest nations with 54% of the total population in India is under 25 years of age and 62% of the total population in the working age group (15-59)
- This demographic advantage is predicted to last only until 2040.
- Only 2.3% of the workforce in India has undergone formal training as compared to 68% in the UK, 75% in Germany, 52% in the USA, 80% in Japan and 96% in South Korea.

Large sections of the educated workforce have little or no jobs, making them largely unemployable. Therefore, India must focus on scaling up the skill training efforts to meet the demands of employers and drive economic growth.

India will soon become the largest provider of skilled workforce in the world. If China has become the manufacturing capital of the world, India will become the human resource capital of the world.

To achieve the goal of "Skill India in Young India", there is a high need to involve industry to upgrade skills to international standards by developing frameworks for standards, curriculum and quality assurance.

"Skilling India will be the basis for Make in India"

Modern Shop floor Engineering @ Saint-Gobain

Saint-Gobain is pioneering a unique initiative of Practice School, to promote Education and Skills required for Contemporary Manufacturing Industry for the benefit of students. For this, Saint-Gobain has partnered with a premier Vocational Education Institution viz Nettur Technical Training Foundation (NTTF) to run a Learn While Earn (LWE) program. LWE program is an onsite program which will provide a certification of 'Diploma in Manufacturing Technology' by NTTF and Saint-Gobain. NTTF will administer this program inside Saint-Gobain premises. This supports the Industry to meet their skill requirements and also provides a unique approach to contemporary vocational education through skill training.

NTTF develops the curriculum in consultation with other large scale like-minded industries. The curriculum is deployed in Practice School with 2496 hours of 'On-the-Job-Training' in the Practice School and 600 hours of theory imparted through classroom sessions.

Students are selected based on a selection process which assess their aptitude to learn, commitment from parents and readiness to pursue the program.

'On-the-Job-Training' in Practice School as a concept, where positions are identified and training is inculcated based on individual learning plan. The knowledge and skills required for each position is mapped and the progression clearly identified, which will reflect in the curriculum and also for assessments. Each student has a learning diary which is monitored closely through academic progress report. The Parent-Teacher interaction is scheduled every six months wherein the progress of each student is discussed.

While India has adequate vocational Education Institution, it lacks industry relevance and readiness for the students. The concept of Practice School in India is a late entry and is essential to bring in Manufacturing Competitiveness with high end skills and Productivity.

Source: National Skill Development Mission – A Framework for Implementation By Ministry of Skill Development and Entrepreneurship

3. RATIONALE

(Need for Modern Shop floor Engineering)

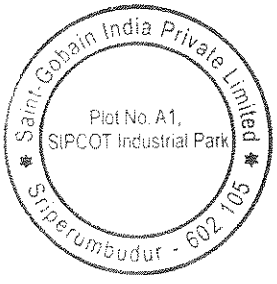
This student intern trained for this job role will be ready for any contemporary manufacturing organization, which requires basic engineering skills and knowledge such as –

Technical Skills –

1. Basic industrial safety – PPE, Machinery and accident prevention
2. Adherence to industrial discipline – 5S activities, Report unsafe acts and conditions as per standards/ protocols
3. Ability to handle equipment – Motor, Oil, Pumps etc
4. Maintaining records as per the Integrated Management System (IMS)
5. Ability to work as per World Class Manufacturing (WCM) standards
6. Ability to identify waste and carry out Kaizen projects in the shop floor
7. Ability to provide suggestions for mistake proofing in the shop floor
8. Ability to follow and adhere to the Standard Operating Procedures (SOPs, VSOPs, OPLs) in the shop floor

Life Skills –

1. Ability to understand and communicate technical English with clarity
2. Ability to operate computer and use internet services (Mail, SAP etc)
3. People Management Skills
4. Ability to work as a professional – Follow work attire, Attendance, Rules & Regulations
5. Ability to work in a team, understand and practice soft skills



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4. JOB ROLE

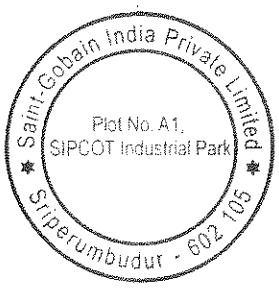
Brief description of Job role:

Manufacturing process comprises of the steps through which raw materials are transformed into a final product. The Job role involves working with heavy machinery on the shop floor, which are computer controlled or mechanically based to set up, maintain, operate and produce high-quality products in a safe environment.

Manufacturing Associate - Modern Shop floor Engineering- this role requires the individual to ensure that the machines are working at full capacity, are stocked with needed materials, well-maintained and perform periodic checks on output for high quality standards. Their responsibilities include maintaining the equipment in good & safe working condition, to operate the machinery efficiently by following the industry standards and regulations.

This role requires the individual to recommend process improvements to enhance operational efficiency and safety. They must understand technical English and communicate effectively with clarity.

They must also be capable of inspecting the equipment and the output, identify any replacements, malfunctions and repairs, detect abnormalities in the product and take corrective measures to produce defect free products.



5. LEARNING OUTCOMES

A. GENERIC OUTCOME

- ❖ Familiarization with the industry Safety & Environment
- ❖ Demonstrate the ability to function as a team member
- ❖ Able to follow safety procedures and company policies
- ❖ Develop good appearance and behaviour, practise tasks as per industry standards
- ❖ Able to Communicate with required clarity and understand technical English
- ❖ Ability to identify and report unsafe operations to Supervisor immediately
- ❖ Able to follow instructions and production schedules
- ❖ Exposure to build on effective communication with inter-departments, sub-ordinates and super-ordinates for smooth operations
- ❖ Awareness on energy conservation, global warming, pollution and optimum utilization of available resources
- ❖ Understand and apply basic computer working, basic operating system and use internet services.
- ❖ Understand their responsibility towards the family and the society. Making him understand that savings should be the first expenditure

B. SPECIFIC OUTCOME

- ❖ Hands-on experience in running production machines and assembling products to customers' satisfaction
- ❖ Focused on applying Lean Manufacturing tools to address the identification of waste from a process and to improve process quality and consistency
- ❖ Recommend process improvements to enhance operational efficiency and safety

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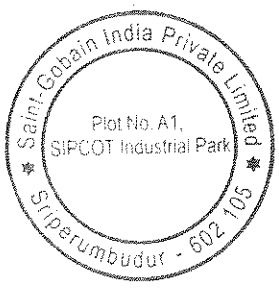
- Focused on ensuring all production processes are completed in agreement with QMS and ISO standards
- Able to apply problem solving skills in identifying alternative solutions to machine related problems
- Contribute to suggestion scheme
- Proficient in the usage of measuring instruments
- Create and maintain activity logs
- Able to perform preventive and regular maintenance on production machinery and equipment
- Able to read and understand blueprints, schematics and manuals
- Able to use the computer for electronic documentation of information related to production activities
- Plan and organize assigned task
- Understand the importance of maintenance
- Become familiar with the function and symbol of electronic components
- Understand the importance of Earthing and the functioning of Protective devices
- Develop creative solutions to problems
- Become conversant with the conventional machining process like drilling , turning, milling , and grinding
- Contribute to waste management programs
- Demonstrate a commitment to quality, timelines, and continuous improvement



6. GENERAL INFORMATION

1.	Name of the Trade	:	Manufacturing Associate - Modern Shop Floor Engineering
2.	Duration of Apprenticeship Training	:	15 Months/3096 Hrs
	Basic Training	:	3 Months/600 Hrs
	Practical Training	:	12 Months/2496 Hrs
3.	Duration of Basic Training		
	a. Part A	:	3 Months /600 Hrs
4.	Total duration of Basic Training	:	3 Months/600 Hrs
5.	Duration of Practical Training (On -job Training)		
	b. Part B	:	12 Months/2496 Hrs
6.	Entry Qualification	:	Passed 10th class
7.	Selection of Apprentices	:	The apprentices will be selected as per Apprenticeship Act amended from time to time
8.	Rebate for ITI passed trainees	:	NA

Note: *Industry may impart training as per above time schedule, however this is not fixed. The industry may adjust the duration of training considering the fact that all the components under the syllabus must be covered. However the flexibility should be given keeping in view that no safety aspect is compromised and duration of industry training to remain as 1 year.*

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7. COURSE STRUCTURE

Training duration details:

Time **(in hours)**	**3 Months** **600 hours**	**12 months** **2496 hours**
Basic Training	Part A	-----
Practical Training (On - job training)	----	Part B

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8. SYLLABUS

8.1 BASIC TRAINING

DURATION: 03 MONTHS

GENERAL INFORMATION

1)	Name of the Trade	:	Manufacturing Associate - Modern shop Floor Engineering
2)	Hours of Instruction	:	600 Hrs.
3)	Batch size	:	30
4)	Power Norms	:	NA
5)	Space Norms	:	112 sq.m
6)	Examination	:	Examination will be conducted by NTTF
7)	Instructor Qualification	:	

a) Degree/ Diploma in Engineering or Masters from recognized university/ Board with one/two year post qualification experience respectively in the relevant field.

8) Tools, Equipment's & Machinery required : - As per Annexure – I

8.1.1 Details of Syllabus of Core Skill
Duration 290Hrs

Sl. No.	Trade Practical (Professional Skills)	Duration 110Hrs	Trade Theory (Professional Knowledge)	Duration 180Hrs
1	Visit to various operations in SGIPL. Exposed to various product specifications and its manufacturing process		• Product - Introduction Definition, Properties and its Composition. Types of products and its methods of manufacturing. Material Handling Procedures & Material disposal procedures.	
2	Understand the risk and impact of not adhering to PPEs. Practice on the selection and operating procedures of fire extinguishers		• General safety, Causes of accidents. Identification of unsafe condition and unsafe acts. Risks & Hazards, Fire Triangle, Types of fire Extinguishers.	
3	Practice on 5S activities in the shop floor.		• Meaning & understanding of 5S. Importance of 5S. Role & Responsibility in 5S implementation.	
4	Understand the impact of holding stock and its implications. Familiarisation of inventory models.		• Definition of inventory , Classification of inventory Importance of inventory control	
5	Familiarisation of various lean tools like SMED,,POKA YOKA ,zero defects, Kaizen ,visual control .		• Lean – Introduction, Concept, Philosophy, Industry as concerns, Constraints on performance Improvement.	

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	Able to link the importance of lean tools in manufacturing. Use of Charts or Videos explaining the wastages of production. Assignments on identification of waste and nonvalue added activities in shop floor.		Seven waste & waste elimination Value added and Non Value added activities. • Lean Tools – Kanban, JIT, Visual control, Andon, Jidoka, Value stream mapping ,SMED, - Concepts and its benefits Suggestions, Importance of giving suggestions , Kaizen– Takt Time , New Paradigm: Non-Blaming Culture	
6	Awareness created about the types of errors by exposure to customer complaints. Introduced to mistake proofing concepts and its role in preventing errors. Practice on implementation of mistake proofing		• Zero defect - Introduction concept & System Variation – Types , Zero defect plan • Poka Yoke – Introduction, Error Approaches , Different kinds of Errors , Inspection Approaches and its significance Five Elements of Production	
7	Exposed to JIT concepts and the importance of pull system in reducing wastes in production.		• JIT- Introduction, Concepts, Objectives, Characteristics, Pre-requisites, Elements and its benefits Pull Vs Push System	
8	Practice on identifying initial abnormalities and providing corrective measures with the support of maintenance person		• TPM – Introduction , Objectives, Benefits 8 pillars of TPM in detail	
9	Familiarise the Importance of using data/facts for problem solving.		• Definition of quality, Customer expectations, Need for quality, Effects of poor quality, Improvement in quality. Quality Control	

	Exercises on 7QC tools. Solving issues related to the shop floor using problem solving methods.		Circle, Problem solving methods, QC tools- Definition concept and objectives, Basic quality tools with examples, Benefits of QC Tools.	
10	Awareness on interpreting documents and manuals compliant to National and International Standards: ISO, OSHA, etc. Participation in preparing and updating information in the machine board. Practice on reading SOPs given		• Definition ,Evolution of ISO systems, Importance of ISO systems, Principles of ISO, Necessary documents of ISO, Introduction to Audit & its types , Non Conformance & its types	
11	Exercises on Marking, Hacksawing ,Filing , Letter and Number Punch.		• Hand tools –purpose and its types (Files , Hammers, Punches , Chisel, Hacksaw ,Spanners, Screwdrivers, Allen key, Scribers, Taps, Angle plate)	
12	Understand the common measuring errors and the need for calibration of instruments. Practice on measuring the thickness of the given object using Micrometre. Exercises on measuring the length ,diameter of the given solid cylinder using Vernier caliper. Exercises on measuring the height of the given object using Vernier height gauge Exercises on measuring the angular dimensions of the given object using Bevel protractor		• Metrology – objectives & its Importance. Physical measurements - S.I. Units. Precision vs. Accuracy. Measuring instruments - Steel rules, Steel tape; Vernier calliper & its types, Principle of Vernier caliper, Least count, Vernier height gauge, Vernier depth gauge. Micrometre – principle & parts, Least count, Types, Error on micrometre bevel protractor, Spirit level, magnetic pull off meter, Pyrometer, Tin side detector	

13	Exercises on measuring the internal dimensions of the given surface using feeler and taper gauge		• Introduction to gauge - Radius gauge , Feeler gauge , Tapper gauge .	
14	Familiarisation of limit , fits and tolerances		• Introduction to Limit system. Interchangeable parts. Elements of limit system, Tolerance- unilateral & bilateral Fits & its types. Symbol for tolerances and fits, Hole basis system, shaft basis system, maximum & minimum clearance calculation.	
15	Exercises on drilling different sizes of holes as per the drawing by using hand and machine. Exercises on drilling operations like Reaming, Tapping, Counter Boring and Counter Sinking		• Drilling -Definition , Types of drill, Parts of a twist drill, Drill angles (point angle, helix angle, rake angle, clearance angle), Centre Drill. Types of Drilling machine(portable, sensitive bench, pillar, radial, gang, multiple spindle)	
16	Familiarisation of Lathe machine. Awareness of cutting fluids and cutting tool Demonstration of Lathe operations.		• Lathe -Introduction, function, Types of lathe (only name). Description and function of lathe parts, Specification of lathe, Work holding devices (types of chucks, faceplate). Lathe operation (facing, turning, step turning, chamfering, taper turning, knurling, boring).	
17			• Milling-Description of horizontal, vertical and	

	Familiarisation of Milling machine and its types. Demonstration of Milling operations .		universal milling machines. Arbor, types of side and face milling cutters, End mill cutters. Milling process (Plain or Slap, Side, Face and End milling), milling cutters material (name only).	
18	Familiarisation of Grinding machine and its types. Awareness on dressing of grinding wheel.		• Introduction, surface grinder, Tool and cutter grinder, Types of grinding operation (surface, External & Internal cylindrical and Form grinding). Construction of grinding wheel (Abrasive, Grain size and Grade), Work holding device (Magnetic Chuck, Vice and V-Block).	
	Revision & Internal assessment		**Revision & Internal assessment**	

8.1.2 EMPLOYABILITY SKILLS

GENERAL INFORMATION

1)	**Name of the subject**	:	**EMPLOYABILITY SKILLS**
2)	**Applicability**	:	Student Intern - MSE
3)	**Hours of Instruction**	:	208 Hrs.
4)	**Examination**	:	The examination will be conducted by NTTF.
5)	**Instructor Qualification**	:	

Degree/Diploma in Engg. from recognized university/Board With one/two year post qualification experience in the relevant field.

And

Must have studied in English/Communication Skill and Basic Computer at 12th /diploma level

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8.1.3 SYLLABUS OF EMPLOYABILITY SKILLS

Block – I

Basic Training

Topic No.	Topic	Duration (in hours)
	English Literacy	60
1	**Reading & Listening comprehension :** Reading & Listening simple English with preparation –news reports ,paragraphs &Videos .	
2	**Functional Grammar** Construction of sentences , Parts of Speech, Tense, Noun-Gender, singular plural, Active and Passive voice, Direct and Indirect Sentences & Punctuation of Sentences	
3	**Speaking skills** Greetings, Self-introduction, Office hospitality .Learn to express the thoughts with clarity. It enables to communicate in a passionate and convincing manner. Dictionary learning, learn a word a day, build confidence in all speaking situations. Synonyms & Antonyms, Jumbled Sentences	
4	**Letter Writing Exercises:** Learn to compose written text for filling document, addressing envelopes, layout of letter –writing request, leave application ,responses to request.	
5	**Dialogue Writing** It enhances the balance between realistic speech and readability. It helps in building character.	
	Soft Skills	

1	**Personality Development:** Basic Personality traits, Interpersonal relations ,Communication and its importance, Body – language, effective listening, barriers to effective listening, Self-awareness, Manners, Etiquettes, Dress code.	**80**
2	**Motivational training:** Setting Role model, Personal goal setting, Achieving the goal, Ethics & values.	
3	**Behavioural Skills** : Human relation principles ,Problem Solving, Time Management, Stress Management ,Confidence Building, Positive Attitude, Fear Handling, SWOT Analysis, Care for Minor detail	
4	**Memory Training:** Types of memory, stages of memory, memory techniques like Acronyms, loci method, Rhymes & songs ,pegging method, chucking.	
5	**Yoga:** Journey to self discovery, increase the self awareness and mindfulness.	
Topic No.	**Topic**	**Duration (in hours)**
	I.T .Literacy	
1	**Basics of Computer:** Computer –Definition, History ,classification, Parts of computer– RAM, ROM, Computer Hardware, CPU & various I/O devices and its applications	
2	**Introduction to MS office**	

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	Microsoft Word Basics of word, understanding basic commands, use of shortcuts, Creating and Editing of Text, Formatting the Text, Insertion & creation of Tables & flowcharts. **Microsoft Excel:** Basics of Excel worksheet, understanding basic commands, creating simple worksheets, use of simple formulas and functions, Creating graphs &charts **Microsoft Power point: Basics** of power point, understanding basic commands, creating power points, how to insert graph, table chart, animation.	**48**
3	**Data Communication & Networks :** Introduction to Networking of computers Introduction to LAN, MAN, WAN	
4	**Internet & its Usage:** Accessing the Internet, Opening an email account and use of email. Social media sites and its implication.	
5	**Flow chart Material Balance**	
	Occupational Safety, Health & Environment Education	**20**
1	**Safety & Health** Introduction to OHS and OSHAS 18001, Introduction to Fire safety, Electrical safety ,General safety awareness & Industrial Safety.	
2	**Occupational Hazards** Hazards & Risks, Chemical Hazards, Mechanical Hazards, Electrical Hazards, Thermal Hazards.	
3	**Accident & safety** Basic principles for protective equipment. General safety, Causes of accidents. Identification of unsafe condition and unsafe acts	
	Environment Management system ISO 14001	
1	**Environment Management system model**	

	Need for EMS,EMS model, Hierarchy of Environmental Management	
2	**Pollution** Pollution and pollutants including liquid, gaseous, solid and hazardous waste.	
3	**Energy Conservation** Conservation of Energy, re-use and recycle.	
4	**Global warming** Global warming, climate change and Ozone layer depletion.	
5	**Ground Water** Hydrological cycle, ground and surface water, Conservation and Harvesting of water	
6	**Environment** Right attitude towards environment, Maintenance of in -house environment	

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8.1.4 SYLLABUS OF BASIC NUMERACY

Block – I

Basic Training

Topic No.	Topic	Duration (in hours)
	Basic Numeracy	38
1	**Percentage Ratio**: Fractions& its types, Percentage problems , Ratio problems	
2	**Mensuration :** Calculation of area of Squares, Rectangles, Triangles and Circles. Calculation of volume of cube, cone ,Cylinder and Sphere ,Bulk densities.	
3	**Basics of Algebra:** Real Numbers and Polynomials, Pairs of linear equations in 2 variables, Quadratic Equations	
4	**Trigonometry:** Pythagoras theorem, Trigonometric ratios, Fundamental identities - problems using identities	
5	**Basic Statistics :** Data & Variable, Mean, Mode and Median ,Standard deviation, Normal distribution, Check sheet, Probability	

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8.1.5 SYLLABUS OF BASIC ELECTRICAL & ELECTRONICS

Block – I

Basic Training

Topic No.	Topic	Duration (in hours)
	Basic Electrical & Electronics	32
1	**Atomic Theory:** Atomic structure, Atomic number , Mass Number calculations Basic definitions of voltage, current ,resistance, capacitance, Inductance and their SI units Ohms Law	
2	**Electronic Components:** Types of components, Resistor types Colour coding of resistor Capacitor types Inductor types Four Laws of Resistance and Resistors in series, Parallel	
3	**Semiconductor Theory:** Types of materials, Types of Semiconductor and PN Junction Theory PN Diode and Forward Bias Reverse Bias and VI characteristics' of PN diode.	
4	**Protective Devices:** Fuse, MCB,ELCB	
5	**Earthing:** System Earthing, Equipment Earthing, Purpose of Earthing Purpose of equipment Earthing.	
6	**Measuring Instruments:** Introduction to Analog & Digital measurements. Voltmeter, Ammeter, Frequency meter & Watt meter Multimeter- use to measure AC/DC voltage/current.	

8.1.6 SYLLABUS OF ENGINEERING DRAWING

Block – I

Basic Training

Topic No.	Topic	Duration (in hours)
	Engineering Drawing	32
1	**Engineering Script** Need for legible lettering and numbering in drawings, Selection of suitable size of letters & numbers as per SP, Exercises: Inclined capital letters & numbers, Exercises: Lower case letters & numbers, Exercises: Writing notes in engineering script, Different paper size explanation.	
2	**Geometric Construction** Practice on free hand sketching, Types of lines and Arc joints ,Construction of triangle and rectangle, Construction of polygon, Construction of circle and Construction of Ellipse. First angle projection symbols, exercises, Third angle projection positioning of three views – Exercises	
3	**Isometric Views & Orthographic Projection** Exercise on drawing the three views of different types of objects in first angle and third angle projection Exercise on 1st angle and third angle projection, Isometric projection Auxiliary views, Missing line exercises, Visualization exercises.	

4	**Sectional Views :** Need for drawing sectional views – to show hidden details explanation of the cutting plane and its representations- principle of selection of cutting plane to give maximum information. Meaning of full section, Half section, Revolved section, removed section, thin section. Conventional practice of showing sections of different materials as per SP 46 Exercises in drawing sectional views	

8.2 PRACTICAL TRAINING (ON-JOB TRAINING)

(BLOCK – I)

DURATION: 12 MONTHS

		GENERAL INFORMATION
1)	**Name of the Trade**	: **Manufacturing Associate - Modern shop floor Engineering**
2)	**Batch size**	: 30 students per batch
3)	**Examination**	: Assessment as per Annexure-III.

4. Instructors Qualification:

i) Degree/Diploma in Engg. from recognized university/Board With one/two year post qualification experience in the relevant field.

5. Infrastructure for On-Job Training : As per Annexure – I

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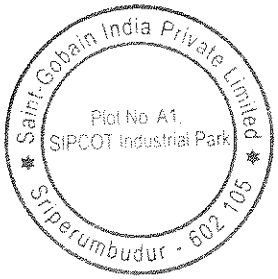
8.2.1 Syllabus for Practical Training/ On the Job Training

Duration – 12 Months

1. Familiarization Industrial - Health, Safety & Environment: Introduction to safety Equipment and their uses. Use of Personal Protective Equipment's (PPE).
2. Improve personal grooming standards and work etiquette
3. Role of Pep Talk and bring in active participation in pep talk
4. 5S and other contemporary workplace management systems to improve productivity and visual management
5. Update process charts as a part of daily routine management for meeting industrial standards
6. Work as a team with data and analyse root cause for various issues relating to day to day routines.
7. Use of Quality Control charts and develop problem solving skills
8. Develop knowledge on modern shop floor practices like World Class Manufacturing, Just in time, POKA YOKA, Kaizen, SMED.
9. Develop skill of Hazard and Environmental incident identification for corrective action.
10. Practice various standards of safety including, work at height, lock out/tag out and various work permit systems.
11. Machine centre wise tagging for various classification of abnormalities
12. Familiarization to Manufacturing technology – heat treatment process of forming, annealing, tempering, etc.
13. Familiarization to machining practices – like drilling, cutting, grinding, trimming, milling & welding.
14. Familiarize with mensuration – like use of different measuring instruments & their working principles.
15. Understanding the importance of Earthing.
16. Use of different types of material handling equipment's that is being available inside the organization.
17. Understand production plan and effective shift plan for plan actualisation
18. Involve in Total Employee Involvement Initiatives like suggestions & Kaizen and small group activities



19. Understanding of production process and system
20. Develop skill to Plan and organize assigned task
21. Detect & resolve issues during execution demonstrate possible solutions and agree tasks within the team.
22. Develop skill on Inspection of goods before packing & dispatch, Understanding of rework concepts.
23. Develop knowledge on different kinds of packing materials which are been used in industry.
24. Ensuring the safe disposal of unwanted material and others wastes from work area.
25. Communicate with required clarity and understand technical English.
26. Build on effective communication with inter departments, sub-ordinates and super-ordinates for smooth operations and safety procedures.

9. ASSESSMENT STANDARD

Assessment Guideline:

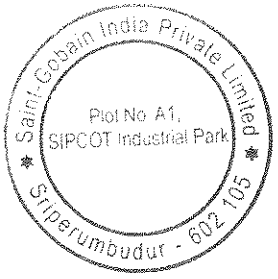
During training, every student will be evaluated in the following modules.

1. Theory & Practical
2. On the Job Training (OJT)

Weightage for theory & practical module is 60 % and

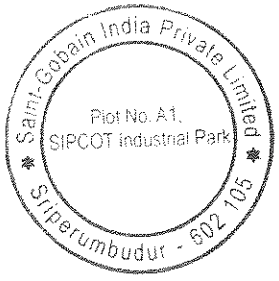
Weightage for On the Job training is 40 %

For understanding Assessment in detail refer Annexure III



10. FURTHER LEARNING PATHWAYS

- Course also provides insights and practical utilization of problem solving tools providing an opportunity for trainees to opt further diploma in manufacturing technology or any other diploma
- On successful completion of the course, trainees can opt for higher studies in the field of engineering.
- Course provides a platform for trainees to experience contemporary manufacturing practices which enhances employability of trainees in large manufacturing facilities
- After completion of course, employment in areas of production, quality control, and logistics is feasible depending on the trainee's area of interest



ANNEXURE – I

TOOLS & EQUIPMENT FOR BASIC TRAINING

INFRASTRUCTURE FOR PROFESSIONAL SKILL & PROFESSIONALKNOWLEDGE

TRADE: Manufacturing Associate - Modern Shop floor Engineering

LIST OF TOOLS & EQUIPMENTS FOR 30 APPRENTICES

A: TRAINEES KIT:-

Sl. No.	Name of the items	Quantity (indicative)
1.	Uniforms	90 Nos
2.	ID cards	30 Nos
3.	Safety Shoes	30 pairs
4.	Safety Helmet	30 Nos
5.	Gloves	30 pairs
6.	Reflector Jackets	30 Nos
7.	Ear Plugs	30 pairs
8.	Industrial Goggles	30 Nos
9.	NTTF ARR book	30 Nos
10.	Learning Diary	30 Nos
11.	HRP Handbook	30 Nos
12.	NTTF Handbook	60 Nos
	Instruments \Tools	
1.	Micrometre	6 Nos
2.	Vernier calliper	6 Nos
3.	Vernier Height gauge	1 Nos

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4.	Tapper gauge	6 Nos
5.	Feeler gauge	6 Nos
6.	Bevel Protractor	3 Nos
7.	Plunger Dial indicator	3 Nos
8.	14" Bastard File	30 Nos
9.	11" Double cut smooth file	30 Nos
10.	Centre punch(90°)	6 Nos
11.	Try square	30 Nos
12.	Ball pein hammer	6 Nos
13.	Cleaning brush(for bench vice cleaning)	6 Nos
14.	Cleaning brush(for machine cleaning)	2 Nos
15.	Scriber	6 Nos
16.	Letter punch(4mm Height)	1 Set
17.	Number punch(4mm Height)	1 Set
18.	Hacksaw blade(HSS) with frame	6 Nos
19.	Ø4.8mm drill bit	5 Nos
20.	M6 Tap with wrench	2 Sets
21.	Ø6.5mm drill bit	2 Nos
22.	Ø12mm Counter bore	1 Nos
23.	Ø6H7 reamer with wrench	2 Sets
24.	Ø5.8mm drill bit	2 Nos
25.	Counter sink tool	1 Nos
26.	Radius gauge	2 Nos
27.	Angle plate	1 Nos
28.	Steel rule(150mm length)	30 Nos
29.	Magnetic V block	1 Nos
30.	Oil can	2 Nos

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31.	Bench Vice	30 Nos
32.	Drill chuck Key	1 Nos
33.	Coolant bottle	2 Nos
34.	Bench Drilling machine	2 Nos
35.	Raw material – Mild steel – 50x50x10mm	30 Nos
36.	Computers	15 Nos

Note: In case of basic training setup by the industry the tools, equipment and machinery available in the industry may also be used for imparting basic training.

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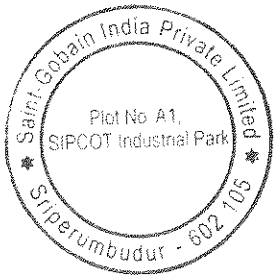
INFRASTRUCTURE FOR ON-JOB TRAINING

TRADE: Manufacturing Associate - Modern shop floor Engineering

Actual training will be conducted in the establishment using their own facility. It depends on the existing facilities available in the establishments. However, the industry should ensure that the broad skills defined against On-Job Training part (i.e. 12 months) are imparted. In case of any short fall, the concern industry may impart the training in cluster mode/ any other industry to cover up the short fall.



ANNEXURE-II

GUIDELINES FOR INSTRUCTORS AND PAPER SETTERS

1. Due care to be taken for proper & inclusive delivery among the batch. Some of the delivery methods adopted may be:

A) Classroom or Instructor-Led Training:

Classroom or instructor-led training methods include the use of Blackboard or whiteboard, overhead projectors, PowerPoint presentations, video training, and storytelling.

B) Interactive Training Techniques:

These techniques incorporate group discussions, Brainstorming, Demonstrations, case studies, active summaries, quizzes, Q&A sessions, question cards, and role playing

C) Hands-on Training Techniques:

Hands-on training provides real-life applications by allowing the trainee to get his/her hands directly on whatever they are learning, creating a sense of empowerment.

D) Computer –Based Training Techniques:

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Computer-based training involves use of Multimedia training materials that provide audio, video, stimulating graphics, or animations.

E) Coaching/Mentoring:

Coaching/mentoring gives employees a chance to receive training one-on-one from an experienced professional.

F) Planned Reading:

In planned reading, trainees need to prepare on specific technical topics before heading into the classroom. Planned reading will provide trainees with a better idea of the technical concepts, giving them a chance to think and learn beforehand.

2. The total hours to be devoted against each topic may be decided with due Diligence to safety & with prioritizing transfer of required skills.

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ANNEXURE-III

GUIDELINES FOR ASSESSMENT

Assessment Guideline:

During training every student will be evaluated in the following modules.

1. Theory & Practical
2. On the Job Training (OJT)

Weightage for theory & practical module is 60 % and

Weightage for On the Job training is 40 %

Theory and Practical pass criteria

PASS CRITERIA (THEORY)

	SESSIONAL MARKS		SEMESTER EXAM		TOTAL	
	MAX	MIN	MAX	MIN	MAX	MIN
ALL SUBJECTS	30	**12**	70	**28**	100	**40**

.The Minimum Pass mark for any theory subject is 40 %.

PASS CRITERIA (PRACTICAL)

	SESSIONAL MARKS		SEMESTER EXAM		TOTAL	
	MAX	MIN	MAX	MIN	MAX	MIN
ALL LABS	25	**10**	75	**30**	100	**40**

The Minimum Pass mark for practical is 40 %.

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SEMESTER PASS CRITERIA

The minimum pass mark for theory is 40%, practical is 40 % and for OJT is 40 %. The overall pass percentage for the three modules put together is 40%.

SUPPLEMENTARY EXAMINATIONS

There shall be two supplementary examinations for each subject.

Computation of Theory Sessional Marks

Test	Marks	Min. Marks
1st Intermediate	20	-
2nd intermediate	20	-
File/Assignment 1	10	-
File/Assignment 2	10	-
Total	60	24
Sessional marks (scaled down to 30)	**30**	**12**

Sessional Practical

Sessional Marks for Practical carries 25 marks. It consists of two parts i.e Viva and Record marks.

Test	Marks	Min. Marks
Viva	10	-
Record mark	15	-
Total	25	10

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ASSESSMENT STANDARD FOR OJT (On the Job Training)

1. KAP – Knowledge assessment process

KNOWLEDGE TEST				
Structure of the Questionnaire				
Written Test - 50 Marks				
S.No	Section	Question Design	Number of Questions	Marks
				Marks x Questions
1	Section A	Choose the best answer	10	10 x 1=10
2	Section B	Match the Following	10	10 x 1=10
3	Section C	Fill in the blanks	10	10 x 1=10
4	Section D	Short Note Answer	3	3 x 3=9
5	Section E	Long Note Answer	1	11 x 1=11

2. SAP – Skill Assessment process

Instructions: Put only (✓) mark in the box for the each skill assessed based on below explained levels:
Level 2: Execute under supervision
Level 3: Excelling: Able to handle operations Independently, Trouble shooting & handling deviations
Level 4: Propagate: Able to train others

Note: Level of question will be asked based on the time period spent by the intern in a particular position & rate L2, L3, L4 as per that

Total Marks = 10 x 5 = 50

S.No.	Skill Judge	L2 (2 Marks)	L3 (4 marks)	L4 (5 marks)	Remark
S1					
S2					

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S3					

As mentioned in the above format totally 10 questions will be framed by the evaluator (Coach).

PASS CRITERIA

KAP		SAP		TOTAL	
MAX	MIN	MAX	MIN	MAX	MIN
50	**20**	50	**20**	100	**40**

The Minimum Pass mark for PST is 40 %.

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