SYLLABUS OF SEMESTER SYSTEM FOR THE TRADE OF

"FOUNDRYMAN"

SEMESTER PATTERN

Under

Craftsmen Training Scheme (CTS)
(One year/Two Semesters)

Revised in
2014

By
Government of India
Ministry of Labour & Employment (DGE&T)

GENERAL INFORMATION

1. **Name of the Trade** : **Foundryman**

2. **NCO Code No.** : 726.10, 725.70

3. **Duration of Training** **:** One year (Two semesters each of six months duration).

4. **Power Norms :** : 11KW

5. **Space Norm :** :128 Sq. Mtr

6. **Entry Qualification** : Passed 10th Class with Science and Mathematics under 10+2 system of Education or its equivalent

7. **Trainees per unit** **:** 20

8. **a. Qualification of Instructors** **:** Degree in Mechanical/Metallurgy Engineering/Advanced Diploma in Foundry Technology from recognized university with one year post qualification experience in the relevant field.
   OR
   Diploma in Mechanical /Metallurgy Engineering from a recognized board of technical education with two year post qualification experience in the relevant field.
   OR
   NTC/NAC passed in same or relevant trade with 3 years post qualification experience.

8b. Desirable Qualification : Preference will be given to a candidate with Craft Instructor certificate (CIC) .

Note:

(i) Out of two Instructors required for the unit of 2(1+1), one must have Degree/Diploma and other must have NTC/NAC qualifications.

(ii) Instructor qualification for WCS and E.D, as per the training manual.

9. For Employability Skills:- One contract/part time / guest faculty for Generic module

i) MBA/ BBA with two years experience **OR** Graduate in Sociology / Social Welfare / Economics with Two years experience **OR** Graduate / Diploma with Two years experience and trained in Employability Skills from DGET institutes

AND

Must have studied English / Communication Skills and Basic Computer at 12th / Diploma level and above

OR

Existing Social Study Instructors duly trained in Employability Skills from DGET institutes

Distribution of training on Hourly basis:

Total hours /week	Trade practical	Trade theory	Work shop Cal. &Sc.	Engg. Drawing	Employability skills	Extra curricular activity
40 Hours	25 Hours	6 Hours	2 Hours	3 Hours	2 Hours	2 Hours

COURSE INFORMATION

1. Introduction:

- This course is meant for the candidates who aspire to become a professional Foundry man.

2. Terminal Competency/Deliverables:

After successful completion of this course the trainee shall be able to perform the following skills with proper sequence.

1. Observe safety and know the use of personal protection and fire safety equipments
2. Trainees will work as a semi skill worker in foundry shop floor.
3. Prepare Sand ,mould, core
4. Able to operate different furnace.
5. Knowledge in melting point temperature of different materials & colour code and quality of product .
6. Knowledge of Technical English terms used in industry.

3. Employment opportunities:

On successful completion of this course, the candidates shall be gainfully employed in the following industries:

1. Production & Manufacturing industries.
2. Structural Fabrication like bridges, Roof structures, Building & construction.
3. Automobile and allied industries
4. Service industries like road transportation and Railways.
5. Ship building and repair
6. Infrastructure and defence organisations
7. In public sector industries like BHEL, BEML, NTPC, etc and private industries in India & abroad.
8. Self employment

4. Further learning pathways:

- On successful completion of the course trainees can pursue Apprenticeship training in the reputed Industries / Organizations.
- On successful completion of the course trainees can opt for Diploma course (Lateral entry).
- On successful completion of the course trainees can opt for CITS course.

SYLLABUS FOR THE TRADE OF FOUNDRYMAN

First Semester
(Semester Code no. FDY - 01)
Duration : Six Month

WEEK NO.	TRADE PRACTICAL	TRADE THEORY
1.	Importance of trade training, List of tools & Machinery used in the trade. Health & Safety: Introduction to safety equipments and their uses. Introduction of first aid, operation of Electrical mains. **Occupational Safety & Health Importance of housekeeping & good shop floor practices.** Health, Safety and Environment guidelines, legislations & regulations as applicable. Disposal procedure of waste materials like cotton waste, metal chips/burrs etc. Basic safety introduction, Personal protective Equipments(PPE):- Basic injury prevention, Basic first aid, Hazard identification and avoidance, safety signs for Danger, Warning, caution & personal safety message. Preventive measures for electrical accidents & steps to be taken in such accidents. Use of Fire extinguishers.	Importance of safety and general precautions observed in the in the industry/shop floor. All necessary guidance to be provided to the new comers to become familiar with the working of Industrial Training Institute system including stores procedures. **Soft Skills: its importance and Job area after completion of training.** Introduction of First aid. Operation of electrical mains. Introduction of PPEs. Introduction to 5S concept & its application. Response to emergencies eg; power failure, fire, and system failure.
2.	Sieve sand mix and Temper by shovel and sand mixer-muller.	History of foundry Industry-Development of foundry in India. Importance of foundry industry. Types of foundries. Advantages of metal casting. Importance of quality and quality awareness.
3	Carry out the different tests such as – moisture content, clay content: strength : permeability & sand grain fineness no. etc. of moulding sand. Prepare dry sand mould with skelton pattern – prepare black wash (plumbago) & coat on mould and core.	Sand testing – Different methods of moisture content test; permeability test clay content test – strength test, sand grain fineness test; refractoriness test of moulding sand. Special casting process –definition; metals used composition; the process; use; advantages and disadvantage of CO_2 process and shell moulding process. Different types of coating on mould cores.
4	Wood Working – Marking: sawing and planning on wood.	Brief description: specification and use of various wood working hand tools. Types of joints & their application in wood working.
5	Making important joints on wood and prepare simple pattern. and	Methods of repairing the patterns & core boxes. Induction hardening of S G Iron casting.

	Repair the wooden patterns & core boxes.	
6	Ramming Practice in moulding boxes with hand Rammers to obtain desired Green hardness such as 60; 70 ; 80 ; 90 on " Green Hardness Tester".	Safety precautions-General while moulding and core making pouring and fettling operation. Common safety equipments used in foundry-First Aid.
7	Use hand Tools : cut channels on rammed boxes with cross section such as square : semicircular ; Trapezoid and Triangular and finish with double enders ; cleaners etc.	Name : specification and their application of various hand tools used in foundry – common types of natural & synthetic moulding sand as per I.S. 3343-1965- properties of moulding sand.
8	Prepare unit sand : prepare mould for block such as square : Rectangular & Round.	Difference between natural and Synthetic moulding sand-principle ingredients in moulding sand & their effect on physical properties-special additives in moulding sand & their effect.
9	Prepare facing and Backing sand Prepare simple moulds with Top run gates.	Facing sand: Backing sand and unit sand – composition of various moulding sand. Types of mould-advantage and disadvantage of sand mould and metal mould.
10	Prepare mould with self leaving core pattern by using parting line gates.	Definition: advantages and disadvantages of "Green sand mould" Skin dry sand mould – Loam sand mould and cement bonded sand mould.
11	Prepare Green sand mould by using split pattern for alminium casting use natural moulding sand Melt aluminium in pit furnace and pour the same into moulds, fettle aluminium casting.	Construction, operation and maintenance of "Pit furnace" name: types construction and use of common foundry equipments such as – moulding boxes [As per I.S. 1280-1958] : [As per I.S. 4475-1967] : crucible [As per I.S. 1748-1961].
12	Level the floor with spirit level and straight edge and prepare open sand mould.	Moulding process-Bench moulding – different methods, advantages, disadvantages and their application.
13	Prepare Bedded in mould [Floor mould with code with bottom run gate].	Moulding process – floor moulding – different methods : advantages : disadvantages and their application. Machine moulding different types of moulding machines – sand slinger and sand bertor.
14-15	Prepare moulds with vertical core print. Prepare simple core and assemble in the mould. Prepare simple mould with horizontal core print and assemble the core in horizontal position.	Core - uses and types – composition of various cores sand mixtures. Types of core boxes – core venting and reinforcing of core-core baking – core making machines.
16	Prepare moulds for copper and copper base alloy's melts copper alloy in pit furnace or oil fired furnace & pour – Fettle copper base alloy's castings.	Construction : operation & maintenance of oil fired furnace. Pattern – Pattern Materials. Difference between wooden pattern and metal pattern.
17	Prepare mould with drawback method and false cheek method.	Pattern – Types of patterns- Allowances on pattern colouring of pattern as per I.S. 1513-1959 – care & maintenance of pattern.
18	Prepare "Stack mould" and "Snap	Gating system – various types of Top run gate, Part

	flask mould".	line run gate & Bottom run gate.
19	Prepare mould with Loose piece patterns & core with Loose piece core box.	Pre-requisites of gating system – Risers : Feeders & directional solidification – chills : chaplets : Denserners & Exothermic matetials.
20	Prepare Cupola for charging chipping and doubling – prepare metal & slag spout ; Tap hole and slag hole ; sand bed; Lining of ladle. Prepare charges for cupola charging – operate cupola furnace – melt cast iron & pour C.I. into mould. Prepare skin dry sand mould with irregular parting line. Cast it by C.I. & Identify casting defects.	Cupola – construction – parts of cupola and their functions – cupola zones – calculation of melting capacity of cupola. Types of materials required for cupola charging – chipping & doubing of cupola – cupola operation.
21	Metal Working – Marking and sawing on straight line –chipping and Filling to desired size on diff. metals. Grinding the metals to desired size by pedestal grinder and Flexible shaft grinder – Drilling on various metals.	Description specification and use of common, marking, measuring; sawing; chipping and filing instruments used in metal work. Types of Grinders – Brief information about other metal cutting equipments – various types of drill bits and drilling machine.
22	Prepare induction furnace for charging. Prepare charges for charging, operate and melt aluminum/magnesium and pour aluminum/magnesium into the mould and identify defects.	Induction furnace: Types- construction, operation and maintenance.
23-25	**Revision**	
26	**Examination**	

SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION
SEMESTER-I

Week No	Workshop Science and Calculation
1	Introduction to Calculation and science.
2	Applied workshop problems involving multiplication and division – common fraction – addition – subtraction – multiplication and division – application of fraction to shop problems.
3	Mensuration, area of rectangles; squares; triangles; circles; regular polygon etc.
4	Works – Unit of work : Energy; Power – Unit of power – applied problems. Various types of woods.
5-7	Algebra – Algebraic symbols, addition; subtraction; multiplication & division of expressions involving algebraic symbols – simple equation.
8-9	Decimals – addition – subtraction, multiplication, conversion of Decimals to common fractions – shop problems.
10-11	Conversion of common fractions to decimal-shop problems.
12-13	Metric system – Metric weights and measurements – units – conversion factors (S.I. Units)
14-15	Shop problems on metric systems of weight and measurement (SI Systems).
16-17	Geometry – Properties of Lines: Angles : Triangles and Circles.
18-19	Mass – Unit of mass Force- The wt. of body unit of wt. shop problems.
20	Square root – square charge; square root of perfect square, the square root of whole no. and a decimals. C.G.S. & F.P.S. systems of Units of Force; weight etc – their conversion Problem.
21-22	Simple ratio & proportion -shop problems. Works – Unit of work : Energy; Power – Unit of power – applied problems.
23-25	**Revision**
26	**Examination**

SYLLABUS FOR ENGINEERING DRAWING
SEMESTER-I

Week No	Engineering Drawing
1	Introduction and Importance of Engg.Drawing.
2	Use of drawing instruments and drawing of straight, inclined and curved lines and.. Free hand square ; circles : polygons etc.
3	-Do-
4	Simple Isometric drawing Isometric view of simple object such as – square; Rectangles; Cubes; Rectangular blocks.
5	Free hand sketches of Trade Tools.
6	Types of lines, uses and scales.
7	Reading of simple Blue print of Geometrical models. Projections, importance of projections and types of projections.
8	Reading of simple Blue print of Geometrical models Sketching of views of simple solid bodies when viewed perpendicular to the surface and axis.
9	Sketching of views of simple solid bodies when viewed perpendicular to the surface and axis.
10	Sketching of views of simple solid as mentioned above when viewed perpendicular to their surface and axes.
11	Sketching of views of simple solid bodies mentioned above when viewed perpendicular to their surface and axes.
12	Dimensioning technique.
13	Free hand sketching of nuts and bolts with dimensions from samples.
14-15	Free hand sketching of rivets and washers with dimensions from samples.
16	Drawing orthographic views in 1^{st} angle method of simple isometric view.
17	Drawing orthographic views in 1^{st} & 3^{rd} angle method of simple isometric view.
18	Free hand sketching of keys, screw –threads with dimensions from samples.
19	Explanation of simple orthographic projection – First angle & Third Angle. Drawing orthographic views in 3rd angle method of simple isometric view.
20	Drawing orthographic views in I angle method of simple isometric view.
21	Conventional symbols of surface finish and materials.
22	Simple view of hollow and solid bodies with dimension – use of different types of Lines and symbols for drawing. View of simple hollow and solid bodies with dimensions. Use of different types of lines and symbols for drawing. Conventional symbols of welding.
23-25	**Revision**
26	**Examination**

SYLLABUS FOR EMPLOYABILITY SKILLS

SEMESTER-I

1. I.T. Literacy **Hours of Instruction : 20 Hrs.** **Marks Allotted : 20**	
Computer	- Introduction, Computer and its applications, Hardware and peripherals, Switching on and shutting down of computer.
WINDOWS	- Basics of Operating System, WINDOWS, The user interface of Windows OS, Customizing Windows Operating System, Create, Copy, Move and delete Files and Folders, Use of External memory like pen drive, CD, DVD etc, Use of *C*ommon applications.
MS office	- Basic operations of Word Processing, Creating, opening and closing Documents, use of shortcuts, Creation and Editing of Text, Formatting the Text, Printing document, Insertion & creation of Tables. - Basics of Excel worksheet, understanding basic commands, creating simple worksheets, understanding sample worksheets, use of simple formulas and functions, Printing of simple excel sheets
INTERNET	- Basic of Computer Networks (using real life examples), Definitions of Local Area Network (LAN),Wide Area Network (WAN), Internet, Concept of Internet (Network of Networks), Applications of Internet : Browsing, Searching, Emailing, Social Networking
WEB Browser	- Meaning of World Wide Web (WWW), Search Engines with examples, Web Browsing, Accessing the Internet using Web Browser, Downloading Web Pages, Printing Web Pages - Information Security and antivirus tools, Do's and Don'ts in Information Security, Awareness of IT – ACT, Importance of information security and IT act, types of cyber crimes.
2. English Literacy **Hours of Instruction: 15 Hrs.** **Marks Allotted : 15**	
Pronunciation	- Phonetics and pronouncing simple words.
Listening	- Interpreting conversation and discussions related to everyday life, Responding to spoken instructions in order to carry out requests and commands.
Speaking	- Asking and answering simple questions in English to describe people, things, situations and events.
Reading	- Reading and interpreting simple sentences, forms, hoardings, sign boards and notices.
Writing	- Writing sentences with simple words, reply to everyday office correspondence, - Writing CV & simple application forms.
3. Communication skill **Hours of Instruction: 15 Hrs.** **Marks Allotted : 15**	
Communication Skills	- Definition, Effective communication, Verbal communication, Use of right words, Non verbal communication, Body Languages.
Motivation	- Self awareness, Goal setting, Career planning, Values and Ethics
Time management	- Managing time effectively through planning
Facing Interviews	- Appearance and behaviour in an interview, Do's and don'ts

Behavioural Skills	- Attitude, Problem Solving, Thinking Skills, Confidence building

Second Semester
(Semester Code no. FDY- 02)
Duration: Six Month

WEEK NO.	TRADE PRACTICAL	TRADE THEORY
1.	Prepare Dry sand mould for cast iron with odd sided pattern.	Brief description : types; advantages & disadvantages of 'Die casting' – centrifugal casting and ceramic moulding process.
2.	Prepare simple "Loam sand mould" for simple pan/bell shape casting.	Brief description : advantages; disadvantages and use of 'Investment casting process'. Binderless dry sand (Full mould) process; Plaster of Paris moulding process.
3.	Prepare Pit mould on foundry floor. Prepare a mould with pattern having cover core print – Assemble cover core in mould cast by cast iron – Fettle C.I. casting.	Slush casting process; Continuous casting process Permanent mould casting process; Nishiyama process (by using ferrosilicon powder) Common casting defects appearance – causes and remedies – salvaging of castings.
4.	Prepare simple CO_2 mould. Prepare simple CO_2 core; assemble in CO_2 mould & cast by cast iron.	Fettling of casting – knock out and removal of casting from mould- removal of gates and risers; Fins and unwanted projection – surface cleaning – trimming and finishing. Inspection of casting – destructive method – non-destructive methods. Refractory materials used in foundry and their grades as per I.S.
5.	Prepare mould for setting "Balancing core" and set balance core in mould with the help of chaplets.	Binders-common binders used in foundry and their application and their grades as per I.S. Common "Facing materials" used in foundry and their application and their grades as per I.S. Casting Design - Functional Design, Simplification of foundry practice, Metallurgical Design, Economic consideration.
6.	Prepare mould to assemble "Hanging core" and set hanging core in mould.	Common "Fluxes" used in foundry and their application. Manufacturing process of coke – Good qualities of coke-specification of coke as per I.S.
7.	Prepare mould for using "Chills": Denseners and fix chill and denseners in mould.	Difference between "Metal and Non-metal" – Difference between ferrous metal and non-ferrous metal. Physical & Mechanical properties of metals.
8.	Prepare core halves; Bake and join by different methods.	Iron ore – pretreatments of iron ore - pig iron – manufacturing process – grades as per I.S. and use cast iron – manufacturing process; grades as per I.S. and use.
9.	Prepare mould with "pencil gate"; Finger gate and cast it by	Common cast iron – Alloy's manufacturing process of chilled cast iron; S.G. iron and malleable cast

	Aluminium.	iron.
10.	Prepare mould with wedge gate and ring gate and cast it by copper base alloy.	Effect of elements normally present in ferrous metals – effect of alloying elements in ferrous metals – iron carbon equilibrium diagram for plain carbon steel. Inoculation: purpose of inoculation.
11.	Prepare mould with Branch gate mould with match plate pattern and cast it by cast iron.	Steel manufacturing process classification – common steel alloys and use.
12.	Prepare mould with relief sprue gate; skin bob gate and cast it by cast iron.	Wrought iron – manufacturing process – use. Copper manufacturing process – properties & uses.
13.	Prepare mould with Horn gate [Gear wheel type pattern] and mould with stepped gate. Industrial visit to observe the special casting process machine moulding process, operation of different furnaces sand reconditioning process. Inspection of casting. Fettling process etc.	Manufacturing process, properties and use of Aluminium, Tin, Zinc, Lead. Metallurgy of Grey Iron. Solidification of Fe-C-Si alloy. Properties of Grey Iron. Microstructure, Fracture, Mechanical Test-Tensile Test, Hardness test etc.
14.	Prepare mould for extra thick casting with large feeder heads and cast it by cast iron.	Manufacturing process of copper base alloys, Aluminium base alloys and magnesium base alloys.
15.	Reline the pit furnace.	Brief information about Blast furnace, Electric furnaces such as Arc furnace & Induction furnace.
16.	Reline the oil fired furnace.	Brief information about open hearth furnace, Air furnace, Rotary furnace, Paddling furnace and convertors.
17.	Reline the cupola furnace.	Heat treatment of casting Hardening, Tempering, Annealing, Normalising, Quenching, Nitriding Cyaniding etc.
18.	Prepare simple oil sand core by using linseed oil and IVP oils.	Calculation of ferrostatic pressure calculation of weight required on a mould.
19.	Prepare simple regular shape mould without pattern. (By cutting practice).	Calculation of molten metal requirement for different size mould (A1, Brass, Copper, C.I. etc.)
20.	Prepare simple casting by gravity die casting process.	Cost estimation of simple castings of different metals. Low pressure and High pressure Die casting process.
21.	Prepare simple casting by Investment casting process and binderless dry sand process	Foundry mechanization – layout of a small foundry – List of material handling equipments and their use.
22-23	**In-plant training** / Project work (work in a team)	
24-25	Revision	
26	Examination	

SYLLABUS FOR WORKSHOP SCIENCE AND CALCULATION
SEMESTER-II

Week No	Workshop Science and Calculation
1-2	Specific gravity; Density calculation on mass : Volume and density by using related formula.
3	Wood density calculations. Importance of wood density (Specially in ship building domain) Simple problems on straight ball cranked levers.
4-5	Calculation on volume and weight of simple solid bodies such as cubes; Hexagonal, prisms – shop problems.
6-9	Heat and Temperature Thermometric scale – Fahrenheit scales and Centigrade scales and their conversion. Name and use of temperature measuring instruments.
10-12	Calculation of volume of sand required for moulds. Calculation of weight of sand and mould boxes.
13	Melting point of commonly used Ferrous & Non-Ferrous materials.
14	Reading of simple graph.
15	Plotting & Reading of simple graph.
16	Electricity and its uses positive and negative terminals use of switches, fuses, conductors and insulators.
17	Levers – Types – Simple problems on mechanical advantage of various levers.
18	Pulley – Types – Mechanical advantage related problems.
19	Friction – Types – Coefficient of friction and related problems.
20	Meaning of Horse Power, and Break Horse Power, simple problems on work energy and power.
21	Stress, Strain – applied problems.
22-23	**In-plant training** / Project work (work in a team)
24-25	Revision
26	Examination

SYLLABUS FOR ENGINEERING DRAWING
SEMESTER-II

Week No	Engineering Drawing
1	Exercises on Isometric views to orthographic views in 1st & 3rd angle method.
2-3	Exercises on Isometric views to orthographic views in 1st & 3rd angle method.
4	Exercises on Isometric views to orthographic views in 3rd angle method
5-6	Exercises on Isometric views to orthographic views in 1st angle method
7-8	Exercises on making isometric views from simple orthographic views.
9	Reading of simple Blue print. Isometric views of simple castings
10	Isometric views of simple castings
11-12	Exercise on blue print reading.
13	Exercises related to missing lies of orthographic views.
14-15	Introduction to geometrical tolerances, fits
16-18	Orthographic projection of different castings.
19-20	Free hand sketching of simple objects related to the trade and preparation of simple working drawings from the sketches.
21	Free hand sketches of Rivets, screws, Nut and Bolt.
22-23	**In-plant training** / Project work (work in a team)
24-25	Revision
26	Examination

SYLLABUS FOR EMPLOYABILITY SKILLS

SEMESTER-II

1.Entrepreneurship skill **Hours of Instruction : 10 Hrs.** **Marks Allotted : 10**	
Business & Consumer	Types of business in different trades and the importance of skill, Understanding the consumer, market through consumer behavior, market survey, Methods of Marketing, publicity and advertisement
Self Employment	Need and scope for self-employment, Qualities of a good Entrepreneur (values attitude, motive, etc.), SWOT and Risk Analysis
Govt Institutions	Role of various Schemes and Institutes for self-employment i.e. DIC, SIDBI, MSME, NSIC, Financial institutions and banks.
Initiation Formalities	Project Formation, Feasibility, Legal formalities i.e., Shop Act, Estimation & Costing, Investment Procedure - Loan Procurement - Agencies - banking Process
2.Environment Education **Hours of Instruction : 10 Hrs.** **Marks Allotted : 10**	
Ecosystem	Introduction to Environment, Relationship between Society and Environment, Ecosystem and Factors responsible for destruction.
Pollution	Pollution and pollutants including liquid, gaseous, solid and hazardous waste.
Energy Conservation	Conservation of Energy, re-use and recycle.
Global warming	Global warming, climate change and Ozone layer depletion.
Ground water	Hydrological cycle, ground and surface water and treatment of water.
Environment	Right attitude towards environment, Maintenance of in-house environment.
3.Occupational Safety, Health & Environment **Hours of Instruction : 10 Hrs.** **Marks Allotted : 10**	
Safety & Health	Introduction to Occupational Safety and Health and its importance at workplace
Occupational Hazards	Occupational health, Occupational hygiene, Occupational Diseases/ Disorders & its prevention
Accident & safety	Accident prevention techniques- control of accidents and safety measures
First Aid	Care of injured & Sick at the workplaces, First-aid & Transportation of sick person
Basic Provisions	Idea of basic provisions of safety, health, welfare under legislation of India
4.Labour Welfare Legislation **Hours of Instruction : 10 Hrs.** **Marks Allotted : 10**	
Welfare Acts	Benefits guaranteed under various acts- Factories Act, Apprenticeship Act, Employees State Insurance Act (ESI), Payment Wages Act, Employees Provident Fund Act, The Workmen's Compensation Act
5.Quality Tools **Hours of Instruction : 10 Hrs.** **Marks Allotted : 10**	

Quality Consciousness	Meaning of quality, Quality Characteristic
Quality Circles	Definition, Advantage of small group activity, objectives of Quality Circle, Roles and Functions of Quality Circles in organisation, Operation of Quality Circle, Approaches to Starting Quality Circles, Steps for Continuation Quality Circles
Quality Management System	Idea of ISO 9000 and BIS systems and its importance in maintaining qualities.
House Keeping	Purpose of Housekeeping, Practice of good Housekeeping.5**S** Principles of Housekeeping: SEIRI – Segregation, SEITON – Arrangement, SEISO – Cleaning, SEIKETSU – maintenance of Standards, SHITSUKE - Discipline

TRADE: FOUNDRY MAN

LIST OF TOOLS & EQUIPMENTS FOR 20 TRAINEES

A : Trainee's Tool Kit:

Sl. No.	Item	Quantity
1	Tool tray steel 145 x 145 x 5 cm	20+1
2	Taper trowel 18 cm round	20+1
3	Heart and square trowels 3 x 1.2 x 1.2 cm	20+1
4	Trowel heart and scoop	20+1
5	Trowel square and scoop	20+1
6	Trowel double scoop	20+1
7	Trowel double square	20+1
8	Tools Spoon 32 x 16 mm – 25 x 6 m	20+1
9	Cleaner 6 x 300 m	20+1
10	Cleaner 9 x 300 m	20+1
11	Vent wire 3 mm	20+1
12	Peg rammer	20+1
13	Flat rammer 75mm x 25mm height	20+1
14	Rapping spike forged and hardened	20+1
15	Hand bellows – 25 cm	20+1
16	Safety goggles (with clear glass)	20+1
17	Goggles (antiglau heat proof)	20+1
18	Cleaner flange	20+1
19	Egg smoother	20+1
20	Smoother round corner	20+1
21	Smoother square corner	20+1
22	Steel rule 300mm	20+1
23	Apron leather or asbestos	20+1
24	Legging pad	20+1
25	Hand gloves (Leather or asbestos)	20+1

B: Tools, Measuring Instruments and Shop Outfit

Sl. No.	Item	Quantity
1	Hammers Ball Peen 0.45 kg	11
2	Ball peen hammers 650 to 700 gms	11
3	Sledge hammer 8 kg	5
4	Claw hammers 0.75 kg	3
5	Chisel cold flat 2x22 cm	11
6	Chisel 200x15 mm	11
7	File Flat 30 cm Bastard	11
8	File Flat 30 cm Second cut	11
9	File half round 30 cm bastard	8
10	File half round 30 cm second cut	11
11	Folding rule 60 cm	5
12	Steel rule 600 mm	5

13	Caliper odd leg	3
14	Caliper inside 15 cm	5
15	Scriber	5
16	Centre punch 15 cm	5
17	Hacksaw 30 cm adjustable	11
18	C Clamps 20 cm	11
19	C Clamps 30 cm light duty steel	11
20	Screw drivers 25cm with 15mm blade	11
21	Screw drivers 15cm	11
22	Screw drivers 18cm	11
23	Pliers 20cm	5
24	Plane grooving 6mm cutter	3
25	Cutting Pliers	3
26	Try Square (for wood work)	11
27	Brick layers hammer 20cm	11
28	Hand lamp wandering lead	3
29	Degasing bale 10cm perforted hood	3
30	Bench vice 12cm jaw	5
31	Work bench for bench vice (245x125x75cm)	11
32	Blow lamp (Kerosene)	5
33	Hand saw	3
34	Steel measuring tape – 3 meter	2
35	Trammel	3
36	Shovel hand	11
37	Engineers try square 15cm	5
38	Lockers steel with 8 drawers each	5
39	Black board with easel	2
40	Fire buckets (2 for water and 3 for sand)	5
41	Stand for fire buckets	2
42	Fire extinguisher foam chemical type	3
43	Fire extinguisher soda ash, etc type CO_2 gas type	1 each
44	Face shield clear	11
45	Helmet (engineers)	11
46	Guantlets leather fettling	11pairs
47	Guantlets leather fettling	11pairs
48	Footware asbestos over shoes	11pairs
49	First Aid Box based on burn treatment	1
50	Lividers firm joint 20cm	5
51	Moulding boxes 30 x 40 x 15 cm RSDL	40 pairs
52	Moulding boxes 75 x 75 x 25 cm RSDL	21 pairs
53	Snap flast 40 x 35 x 12 cm RSDL	1 pair
54	Snap flast 30 x 30 x 10 cm RSDL	1 pair
55	Spirit level	5
56	Wheel Barrows	2
57	Weighing machine (cap: 0.001 to 150gm)	1 no.

C: List of Equipments & General Installations

Sl. No.	Item	Quantity
1	Air Compressor with maximum working pressure of 17.5 kg/cm^2	1 no.
2	Pneumatic Rammer with Rubber Rammer head	1 no.
3	Pneumatic Chisel (with suitable chisel)	1 no.
4	Moulding Sand mixmuller 35 kg capacity with motor impeller 30 RPM	1 no.
5	Mould Green Hardness Tester dial type Risdale diels st.	1 no.
6	Core hardness tester	1 no.
7	CO_2 cylinder with CO_2 probe and Rubber Hoses with nozzle 12 mm wheel valve.	1 no.
8	LPG Cylinder with heating torch	1 no.
9	Cylinder trolly suitable to CO_2 cylinder and Indane Gas Cylinder	1 no.
10	Heating and pumping unit to suit to oil fired tilting type crucible furnace with Heating pressure gauge etc. Wesman model SPM Simplex model motorized Rotary gear oil pump pre-heater.	1 no.
11	Sand Testing Equipment- permeability meter, Universal Strength tester, Sieve shake, standard sand rammer, Shatter Index Tester, Clay content Tester, Speedy Moisture teller.	1each
12	Moulding Machine hand squeeze with stripping device pin lift type.	1 no.
13	Weighing machine 300 kg by 100 gms	1 no.
14	Pedestal grinder DE 35cm power operated	1 no.
15	Core oven 180 x 90 x 90 cm electric hot air circulated with maximum temperature 350^oC adjustable	1 no.
16	Cupola capacity 1.5 tons/hours. Motorised blower and pipe line volume gauge, pressure gauge, charging platform, blast control valve spark arrester.	1 no.
17	Sand Sampler	1 no.
18	Auto Sand riddle with 3 tons/hors. ridding capacity	1 no.
19	Sand Erator	1 no.
20	Oil Fired tilting type crucible furnace furnace to fit no. 100 crucible	1 no.
21	Induction furnace (Cap:50Kg) suitable for non-ferrous metals	1 no.

LIST OF TRADE COMMITTEE MEMBERS

Sl. No.	Name & Designation Sh/Mr/Ms.	Organization	Mentor Council Designation
Members of Sector Mentor council			
1.	A. D. Shahane, Vice-President, (Corporate Trg.)	Larsen & Tourbo Ltd., Mumbai:400001	Chairman
2.	Dr. P.K.Jain, Professor	IIT, Roorkee, Roorkee-247667, Uttarakhand	Member
3.	N. Ramakrishnan, Professor	IIT Gandhinagar, Gujarat-382424	Member
4.	Dr. P.V.Rao, Professor	IIT Delhi, New Delhi-110016	Member
5.	Dr. Debdas Roy, Asstt. Professor	NIFFT, Hatia, Ranchi-834003, Jharkhand	Member
6.	Dr. Anil Kumar Singh, Professor	NIFFT, Hatia, Ranchi-834003, Jharkhand	Member
7.	Dr. P.P.Bandyopadhyay Professor	IIT Kharagpur, Kharagpur-721302, West Bengal	Member
8.	Dr. P.K.Ray, Professor	IIT Kharagpur, Kharagpur-721302, West Bengal	Member
9.	S. S. Maity, MD	Central Tool Room & Training Centre (CTTC), Bhubaneswar	Member
10.	Dr. Ramesh Babu N, Professor	IIT Madras, Chennai	Member
11.	R.K. Sridharan, Manager/HRDC	Bharat Heavy Electricals Ltd, Ranipet, Tamil Nadu	Member
12.	N. Krishna Murthy Principal Scientific Officer	CQA(Heavy Vehicles), DGQA, Chennai, Tamil Nadu	Member
13.	Sunil Khodke Training Manager	Bobst India Pvt. Ltd., Pune	Member
14.	Ajay Dhuri	TATA Motors, Pune	Member
15.	Uday Apte	TATA Motors, Pune	Member
16.	H B Jagadeesh, Sr. Manager	HMT, Bengaluru	Member
17.	K Venugopal Director & COO	NTTF, Peenya, Bengaluru	Member
18.	B.A.Damahe, Principal L&T Institute of Technology	L&T Institute of Technology, Mumbai	Member
19.	Lakshmanan. R Senior Manager	BOSCH Ltd., Bengaluru	Member
20.	R C Agnihotri Principal	Indo- Swiss Training Centre Chandigarh, 160030	Member
Mentor			
21.	Sunil Kumar Gupta (Director)	DGET HQ, New Delhi.	Mentor
Members of Core Group			
22.	N. Nath. (ADT)	CSTARI, Kolkata	Co-ordinator

23.	H.Charles (TO)	NIMI, Chennai.	Member
24.	Sukhdev Singh (JDT)	ATI Kanpur	Team Leader
25.	Ravi Pandey (V.I)	ATI Kanpur	Member
26.	A.K. Nasakar (T.O)	ATI Kolkata	Member
27.	Samir Sarkar (T.O)	ATI Kolkata	Member
28.	J. Ram Eswara Rao (T.O)	RDAT Hyderabad	Member
29.	T.G. Kadam (T.O)	ATI Mumbai	Member
30.	K. Mahendar (DDT)	ATI Chennai	Member
31.	Shrikant S Sonnavane (T.O)	ATI Mumbai	Member
32.	K. Nagasrinivas (DDT)	ATI Hyderabad	Member
33.	G.N. Eswarappa (DDT)	FTI Bangalore	Member
34.	G. Govindan, Sr. Draughtsman	ATI Chennai	Member
35.	M.N.Renukaradhya, Dy.Director/Principal Grade I.,	Govt. ITI, Tumkur Road, Banglore, Karnataka	Member
36.	B.V.Venkatesh Reddy. JTO	Govt. ITI, Tumkur Road, Banglore, Karnataka	Member
37.	N.M.Kajale, Principal,	Govt. ITI Velhe, Distt: Pune, Maharashtra	Member
38.	Subrata Polley, Instructor	ITI Howrah Homes, West Bengal	Member
39.	VINOD KUMAR.R Sr.Instructor	Govt.ITI Dhanuvachapuram Trivendrum, Dist., Kerala	Member
40.	M. Anbalagan, B.E., Assistant Training Officer	Govt. ITI Coimbatore, Tamil Nadu	Member
41.	K. Lakshmi Narayanan, T.O.	DET, Tamil Nadu	Member
Other industry representatives			
42.	Venugopal Parvatikar	Skill Sonics, Bangalore	Member
43.	Venkata Dasari	Skill Sonics, Bangalore	Member
44.	Srihari, D	CADEM Tech. Pvt. Ltd., Bengaluru	Member
45.	Dasarathi.G.V.	CADEM Tech. Pvt. Ltd., Bengaluru	Member
46.	L.R.S.Mani	Ohm Shakti Industries, Bengaluru	Member