COVER

SYLLABUS FOR (TRADE NAME) ... LATHE OPERATOR

UNDER OF REGULATIONS FOR
INDUSTRIAL SCHOOLS

AS APPROVED BY

DEPARTMENT OF EMPLOYMENT
AND TRAINING, CHEPAUK,
CHENNAI-600 005.

..... 2004 .....

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LIST OF COMMITTEE MEMBERS

FOR THE TRADE OF LATHE OPERATOR

1. MEMBERS AND EXPERTS ...

1. Thiru. S.SUBBIAH
   RJD, COIMBATORE.

2. Thiru. S.RAVI BASKAR
   Asst. Director

3. Thiru. P.RAJAMUTHU
   A.T.O.

4. Thiru. N.POOMALAI
   A.T.O.

5. Thiru. J.RANGA RAJ
   A.T.O.

6. Thiru. M. BASKARAN
   J.T.O

COURSE DETAILS

Name of Trade	**: LATHE OPERATOR**
Qualification	**: VIII Pass**
Age	**: 14-40 Years**
Duration	**: 1 Year**
Number of Trainees	**: 20**
Number of Practical hours	**: 32 hrs. per week**
Number of Theory Hours	**: 8 hrs. per week**
Number of Workshop Calculation hours	**: 2 hrs. per week.**
Number of Engineering Drawing hours	**: 2 hrs. per week**

Space Required

Workshop	**: 550sq. feet**
ClassRoom	**: 200 sq. feet**

Power Required in KW **: 7 k.w.**

Week No.	Practical	Theory
1.	Getting to know the lathe With its main components.	Importance of safety and precautions.
2.	Mounting and dismounting chuck spindle and unloa--ding in various system.	Measurement, line.steel rule types, graduation and limita tion.
3.	Turning of round head stock on 4-jaw indenpendent chuck.	Hammer chisel-prick punch, scribe and.
4.	Grinding cutting tools checking of angle with tools angle gauge.	Try-square etc. calipers-types and uses.
5.	Setting of lathe tools in different types of tool post	scribing block, Hack-saw-frame types & uses.
6.	Facing operation to correct length	Centre punch. Hack-saw blades-size, different pitch for different materials.
7.	Step turning	History and gratual development of lathe and dismounting chuck.
8.	Parallel turning	Function and construction of different parts of lathe.
9.	Step turning chamfering	Cone pulley type-allgeared Type Tumbler gear set.
10.	Drilling on lathe-step drilling	Back Gear unit-its construction and speed calculation.
11.	Boring & step, boring-with + 0.08mm accuracy.	Lathe cutting tool-Different types shapes and different angles (clearances and rakes)
12.	Boring & internal recessing	Different types of lathe tool posts.quick change gear box feed shaft, lead screw etc,

13.	Checking alignment of lathe centres	Feed shaft and leads screw
14.	Reaming in lathe	Combination drill. Drill chuck its uses.
15.	Knurling in lathe	Cutting speed, feed depth of cut,
16.	Turning - between centres on mandrel	Vernier caliper reading least count etc.
17.	Taper turning by offsetting tailstock method.	Outside micrometer principle, graduation, reading
18.	Taper turning by offsetting tailstock method.	Types of Micrometer
19.	Taper turning by compound slide swiveling	Sources of error with micro meter & how Use of digital measuring instruments.
20.	Taper turning by taper turning attachment.	Lathe accessories chuck independent
21.	Eccentric turning	Self centering, collect, magnetic etc. its function construction and uses.
22.	Eccentric boring,	Cuting speed for different material Boring tool. counter -shinking and counterboring.
23.	Screw thread cutting (B.S.W) internal	Driving plate, face plate, fixed & traveling steadies construction
24.	Screw thread cutting metric thread	Revision
25.	Hand chaser threads non-ferrous materials.	Lathe Centres- types and their uses. Lathe carrier- function types & uses.
26.	Screw thread (Internal) metric.	Reamers- types and uses.

27.	Tool gringing for Sq.thread (External)	Knurling meaning, necessity, types, grade, cutting speed for knurling
28.	Tool grinding for Sq.thread (internal)	Limit fit tolerance
29.	Fitting of male and female "V" threaded components.	Lathe mandrel - different types and their uses.
30.	Acme thread cutting (tool Grinding)	Types of Fit.
31.	Fitting of male & female square thread components.	Taper- necessity, different methods of expressing tapers
32.	Buttress thread cutting	Different standard tapers
33.	Form turning practice	Method of taper turning, Important dimensions calculation
34.	Attachment lathe Grinding.	Taper turning by swiveling compound side
35.	Taper turning, taper turning attachment	Vernier bevel protractor
36.	Internal taper turning by taper turning attachment. c.1 block.	Taper turning by Taper Turning Attachment
37.	Turning and boring	Different types of form tool & their uses.
38.	Negative rake tool on non-ferrous metal.,	Combination set-square head. Centre head, protractor head uses.
39.	Balancing, grinding wheel.	Radius gauge, Screw pitch gauge metric /inches
40.	Industrial visit	Ring gauge, plug gauge.
41.	Crankshaft-single throw	Vernier height gauge uses.
42.	Turning of long shaft (using steadies) (with in a 0.03 mm)	Screw thread- definition,purpose

43.	Use of attachments on lathe for different operations.	fundamentals of thread cutting on lathe
44.	Thread cutting on non-ferrous.	Different types of screw thread and their parts and elements.
45.	Boring and stepped boring	Thread chasing tail, uses.
46.	Continuation of thread cutting.	Different methods of forming
47.	Multiple thread cutting (B.S.W)	Handchaser - types uses etc.,
48.	Multiple thread cutting metric. .	Tap & Die
49.	Acme thread cutting.	Capstan lathe its main parts function uses
50.	Square thread cutting form (male & Female)	Turret lathe its main parts & function uses
51.	Setting & Operation involving face plate and angle plate.	Collapsible it uses
52.	Split bearing Bush .	Test.

Week No.	Workshop Calculation	Engineering Drawing
1.	Arihtmetics: Fundmental operation	Introduction about Engineering Drawing
2.	Addition, subtraction, multiplication, division	Engineering drawing types and their importance
3.	Fraction and decimals	Lettering Practice inclined inclined, Vertical
4.	Conversion of fraction to decimal and decimal to fraction.	Types of lines and their meaning and application
5.	System of unit and SI units for length area, volume and their	Simple conventional symbols for material and parts
6.	Units of temperature force work power and energy shop problems	Uses and application of Drawing instruments
7.	Multiplication and division of power root of a number	Geometrical construction of angles and triangles.
8.	Square root by arithmetics and problems related to the trade.	Geometrical constructions of circles and triangles Quadrilaterls
9.	Percentage, changing percentage to decimal and fraction and vice versa	Geometrical constructions of polygons, ellipse
10.	Problems on percentage related to trade	Geo. constructions of parabola and hyberbola.
11.	Ratio finding forms and ratio proportions.	Freehand sketching of st lines oblique lines rectangles, circles
12.	Direct proportion and indirect proportions	Cube cone, prism, cylinder, sphere, pyramids
13.	Application of ratio and proportion to shop problems	scales construction of plain scale Representative fraction
14.	Algebra- sign and symbols used in algebra co efficient terms and unlike terms	Types of Dimensioning

15.	Algebraic addition substraction multiplication and division	Dimensioning technique size and location dimension for part 5, holes angles.
16.	Power and laws of exponent	Indtroduction of Isometric Drawing
17.	Algebraic - simplification problems	Orthographic drawing application of both first and third angle methods
18.	Factor and equation algebraic formula	Orthographic drawing application of both first and third angle methods
19.	Factors and different types of factorisation	Orthographic drawing application of both first and third angle methods
20.	Factorisation problems	To draw orthographic views in first angle methods
21.	Equations like simple and simultaneous	To draw orthographic views in first angle methods
22.	Logarithams and use of logaritham tables	To draw orthographic views in first angle methods
23.	Logarithams, logaritham and exponent	To draw orthographic views in first angle methods
24.	Use of logaritham and anti logaritham tables	To draw orthographic views in first angle methods
25.	Problem related to trade using logaritham tables	To draw orthographic views in first angle methods
26.	Fundamental geometrical definition of angle and properties of triangle	To draw orthographic views in third angle methods
27.	Pythagoras Theorem: properties of similar Triangles	To draw orthographic views in third angle methods
28.	Application of geomentry to shop problems	To draw orthographic views in third angle methods
29.	Rectangular square rombus and their properties	To draw orthographic views in third angle methods
30.	Circle and properties of circle, regular polygons	To draw orthographic views in third angle methods

31.	Mensurtion:- Plain figures triangules square rectangle parallelogram	To draw orthographic views in third angle methods
32.	Plain figures trapizium regular polygons circles	To draw orthographic views in third angle methods
33.	Triangle law of forces parallelogram of forces	To draw orthographic views in third angle methods
34.	Material weight and cost problems related to the trade	To draw orthographic views in third angle methods
35.	Friction-co-efficient of friction	To draw orthographic views in third angle methods
36.	Simple problems related to friction	To draw orthographic views in third angle methods
37.	Electicity and its uses electric current positive and negative terminals	To draw orthographic views in third angle methods
38.	Use of fuses and swithces conductors and insulators	To draw orthographic views in third angle methods
39.	Ohm's law simple calculation electrical insulating materials	To draw orthographic views in third angle methods
40.	Practice on simple pocket calculator	To draw orthographic views in third angle methods
41.	Meaning of elasity, mallebility brittleness, hardness ductility examplels	Freehand sketches of trade related handtools cutting tools measuring instruments
42.	Meaning of elasity mallebility brittleness, hardness ductility examplels	Freehand sketches of trade related handtools cutting tools measuring instruments
43.	Heat teatment of steel hardening, annealing tempering normalising case hardening	Freehand sketches of trade related handtools cutting tools measuring instruments
44.	Heat treatment of steel hardening annealing tempering normalising case hardening	Freehand sketches of trade related handtools cutting tools measuring instruments

45. Magnetic substances natural & artificial magnets	Freehand sketches of trade related hand tools cutting tools measuring instruments
46. Method of Magnetisation uses of magnets	Screw threads their standard forms as per ISI Internal and external threads
47. Revision	Sketches bolts and nuts screws and other screwed members
48. Solution of SCVT test papers	Sectional Views
49. Solution of SCVT test papers	Sectional views
50. Institute test	Institute test
51. Revision	Revision
52. SCVT test (final)	SCVT Test (final)

ACHIEVEMENTS

1. Tool Grinding, different angles, measurement with scale & Caliper Cutting speed and feed.

2. Drilling, boring reaming knurling, micrometer, vernier caliper. Counter boring

3. Taper Turning methods, Eccentric turning ,combination set

4. Eccentric Turning Thread fitting with worth, hand chaser Metric inches thread cutting.

5. Chaser on non ferrous material vee thread components

6. Square thread cutting Acme thread cutting

7. Single throw crank shaft turning Tool grinding vee, square, Acme.

8. Multiple thread cutting face plate work.

Industrial School

Long Term Trade - Syllabus – Revised

Name of the Trade : LATHE OPERATOR

Space required:

Workshop / Lab : 550 Sq. ft.

Class Room : 200 Sq. ft.

TOOLS AND EQUIPMENT FOR THE TRADE LATHE OPERATOR :

S/NO	NAME OF THE ITEM	QUANTITY REVISED
1	TOOL KIT CALIPER OUTSIDE FIRM AND SPRING JOINT 150 mm	10
2	CALIPER INSIDE FIRM AND SPRING JOINT 150 mm	10
3	CALIPER ODD LEG FIRM JOINT 150 mm	10
4	STEEL RULE 150 mm TO READ METRIC	10
5	SCRIBER 150 mm X 3 mm	10
6	HAMMER BALL PEIN 250 GM WITH HANDLE	10
7	CENTRE PUNCH 100 mm	10
8	PRICK PUNCH 100 mm	10
9	DIVIDER SPRING JOINT 150 mm	10
10	SAFETY GOGGLES CLEAR GLASS (GOOD QUALITY)	10
11	SHOP OUTPUT SURFACE PLATE 30 X 30 cm ON METAL STAND	1
12	WORK BENCH 120 X 120 X 75 cm (HIGH)	1
13	MARKING TABLE (C.I) 60 X 60 cm	1
14	BENCH VICE 125 mm JAW	2
15	VEE-BLOCK 75 mm WITH CLAMP	1 PAIR
16	SURFACE GAUGE 250 mm ARM	2
17	HACKSAW ADJUSTABLE 200 TO 300 mm (PISTAL GRIP)	5
18	FILE FLAT 250 mm 2 ND CUT	2
19	FILE FLAT 250 mm SMOOTH	2
20	FILE HALF ROUND 250 mm 2 ND CUT	2
21	FILE ROUND 250 mm SMOOTH	2
22	COMBINATION SET 300 mm RULE	1 SETS
23	SCREW DRIVER 200 & 300 BLADE HEAVY DUTY	1
24	SPANNER DOUBLE ENDED 6 mm TO 24mm	1 SET

S/NO	NAME OF THE ITEM	QUANTITY REVISED
25	PLIERS FLAT NOSE 150 mm SIDE CUTTING	1
26	MICROMETER INSIDE 0 – 25 mm	1
27	MICROMETER OUTSIDE 25 – 50 mm	1
28	MICROMETER OUTSIDE 0 – 25 mm	1
29	VERNIER CALIPER OUTSIDE, INSIDE AND DEPTH 200 mm/8" WITH METRIC AND INCH SCALE	1
30	FEELER GAUGE 100 mm BLADE METRIC SET	1 SET
31	RADIUS GAUGE 1-12 mm BY 0.05 mm	1 SET
32	CENTRE GAUGE COM .60 DEGREE AND 55 DEGREE	1 SET
33	SCREW PITCH GAUGE WHITHWORTH AND METRIC	1 SET
34	DIAL TEST INDICATOR 0.01 mm WITH MAGNETIC BASE	1
35	TRY SQUARE 150 BLADE	1
36	WHEEL DRESSER DISMOND(INSERTED)	1
37	MORSE TAPER SLEEVES No.0-1, 1-2, 2-3,3-4, 4-5, 1-3	1 set
38	DRIFT	1
39	TWIST DRIL ST. SHANK 1TO 6 MM BY 1 MM	1Set
40	TWIST DRILL TAPER SHANK 6 MM TO 20 , 1 MM	1Set
41	DRILL CHUCK 0-6 MM CAP . WITH KEY	1
42	TAP & DIE METRIC SET UPTO 25 MM	EACH 1 Set
43	REAMER MACHINE ST.FLUTE 6 TO 16 MM BY 1 MM	1 Set
44	TOOL HOLDER RH &STRAIGHT FOR ¼''SQ.TOOL BIT	2
45	STEEL RULE 300 MM WITH METRIC AND INCH	2
47	SPIRIT LEVEL 0.05 METER 200 MM	1
48	COMBINATION DRILL A-4	1
49	CHALK BOARD ON MOBILE STAND	1
50	ALMIRAH	1
51	STUDENT LOCKER WITH DRAWER (PIGION HOLES)	1
52	REVOLING CENTER (TO SUIT LATHE TAILSTOCK)	1
53	DOG CARRIER 25 MM, 50 MM & 75 MM	1Set
54	FIRE EXTINGUISH AND BUCKETS	2 EACH
46	OIL CAN 1/2PINT (PRESSURE FEED SYSTEM)	2
47	SPIRIT LEVEL 0.05 METER 200 MM	1
48	COMBINATION DRILL A-4	1
49	CHALK BOARD ON MOBILE STAND	1

MACHINERIES

SNO	DESCRIPITION	QUANTITY REVISED
1	LATHE S.S & S.C (ALL GEARED HEADSTOCK) 15 CM CENTER HEIGHT, TO ADMIT 120 CM CENTER MACHINE TO BE MOTORISED AND SUPPLIED WITH COOLANT INSTALLATION, 4-JAW INDEPENDENT CHUCK 250 MM, 3-JAW SELF-CENTERING CHUCK 150 MM. FIXED STEADY, TRAVELLING STEADY, FACE PLATE, 4-WAY TOOL POST,QUICK CHANGE GEAR BOX FOR METRIC/INCH. THREADS, LIVE AND DEAD CENTERS WITH T/ATTACHMENTS.	2
2	LATHE S.S & S.C (ALL GEARD TYPE) 20 HEIGHT 150 CM BETWEEN CENTRES, GAP BED MACHINES TO BE MOTORISED & SUPPLIED WITH COOLANT INSTALLATION,4-JAW INDEPNDENT CHUCK 200 MM. FIXED STEADY FACE PLATE, 4-WAY TOOL POST, QUICK CHANGE GEAR BOX METRIC /INCH. THREADS, LIVE AND DEAD CENTRES WITH TAPER ATTACHMENTS.	1
3	LATHE S.S & S.C (CONE PULLEY TYPE) 15 CM HEIGHT 90 CM BETWEEN CENTERS. MACHINE TO BE MOTORISED 4-JAW INDEPENDENT CHUCK 250 MM 3-JAW SELF-CENTERING CHUCK, 150 MM SINGLE TOOL POST.	2
4	GRINDING MACHINE BENCH D.F BENCH GRINDER 150 MM DIA.	1
5	DRILL MACHINE PILLAR TYPE-MOTORISED UPTO W 12 MM CAP.	1