

**SYLLABUS OF SEMESTER SYSTEM  
FOR THE TRADE OF**

**METAL CUTTING ATTENDANT  
(FOR VISUALY IMPAIRED)**

**SEMESTER PATTERN**

**Under**

**Craftsmen Training Scheme (CTS)  
(Two years/Four Semesters)**

**Revised in  
2014**

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

## GENERAL INFORMATION

1. **Name of the Trade** : METAL CUTTING ATTENDANT (For Visually Impaired Persons)
2. **N.C.O. Code No.** :
3. **Duration of Craftsmen Training:** Two years (Four semesters each of six months duration).
4. **Power norms** : 18 KW
5. **Space norms** : 100Sq.mt.
6. **Entry Qualification** : Passed 10<sup>th</sup> Class with Science and Mathematics under 10+2 system of Education or its equivalent
7. **Trainees per unit** : 20
- 8a. **Qualification for Instructors** : Degree in Mechanical Engineering from recognized university with one year post qualification experience in the relevant field

OR

Diploma in Mechanical Engineering from recognized Board of Technical Education with two years post qualification experience in the relevant field

OR

NTC/NAC in the Trade of “Fitter” with 3 years post qualification experience in the relevant field.

- 8b. **Desirable qualification** : Preference will be given to a candidate with Craft Instructor Certificate (CIC).

**Note:** For Motor Skill Training Programme, Braille & Arithmetic with G.K., Craft & Book Binding and Mobility & Daily Living guest faculty may be engaged.

**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 12<sup>th</sup> / 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.	Employability skills	Extra curricular activity
40 Hours	26 Hours	8 Hours	2 Hours	2 Hours	2 Hours

## **COURSE INFORMATION**

### **1. Introduction:**

- This course is meant for the Visually Impaired candidates who aspire to become a semi-skilled Metal cutting attendant.

### **2. Terminal Competency/Deliverables:**

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

1. The trainee can work in the industry as semi-skilled Metal cutting attendant.
2. The trainee can work in the field of lathe, drilling, milling, ball press, shearing machine.
3. The trainee can work in the Computer with JAWS.

### **3. Employment opportunities:**

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

1. Production & Manufacturing industries.
2. Service industries like road transportation and Railways.
3. Defence organizations
4. In public sector industries like BHEL, BEML, NTPC, etc and private industries in India & abroad.
5. Self employment

## SYLLABUS FOR THE TRADE OF

### METAL CUTTING ATTENDANT for VISUALLY IMPAIRED PERSONS

**First Semester**  
**(Semester Code no. MCA-V/I - 01)**

**Duration : Six Month**

Week No.	MOTOR SKILL TRAINING PROGRAMME	BRAILLE & ARITHMETICS WITH G.K.
1.	Introduction Training Familiarization with the Institute. Importance of trade training. Machinery used in the trade. Types of work done by trainees in the trade. Introduction of safety rules in the shop floor and to the firefighting equipment etc. Introduction of First Aid. Operation of Electrical Mains.	Importance of Safety and Precautions to be oversexed in the section as well as in the Institute causes of accident and its remedies. Importance of the trade in the Industrial development of the country. Subjects to be taught and standard of proficiency to be attained. Awareness of recreational, medical leave and other facilities necessary guidance to be provide to become familiar with the working of the Institute including stores procedures.
2.	Exercise on Minnesota Rate of Manipulation Test  (i) Displacing (ii) Turning	Recognition of Dots, Counting. Direction & position of dots.
3-4.	Exercise on Pennsylvania Bi-Manual Work sample (i) Assembly (ii) Disassembly	Recognition of writing frame and cell (L & R). Preparing the margin of the sheet, setting of paper write letters.
5.	Exercise on purdue pegboard (i) Right Hand (ii) Left Hand Purdue Pegboard (iii) Both Hand	Word writing (Dictation from Text Books)
6	Purdue Pegboard (iv) Assembly	Simple punctuation, Number writing 1-10. Text Book Reading.
7-8	Exercise on Crawford small parts dexterity Test Pin & Collar.	G.K. India & Indians, World & UNO, Solar System, Artificial Satellite & outer space. Common diseases, their treatment, First-Aid. Common Eye diseases & prevention.
9.	Exercise on Crawford small parts dexterity Test of Screws	Democracy & Election, Modern Science Recognition of Taylor Frame. Recognition of numbers. Number reading and writing.

10-11.	Exercise on Stanford-khos Block Design Test	<p>Concept of addition, Subtraction, Multiplication &amp; Division I.M.C. (Indian Mathematics Code)</p> <p>Application of I.M.C. Addition, Subtraction, Multiplication and division of fraction and decimal.</p> <p>Conversion of inches to millimeters and vice versa.</p>
12.	Various types of measuring tools & instruments orientation.	Different kinds of gauges, its usage.
13.	Micrometer, its usage.	Structure & its usage of Braille Micrometer.
14.	Angle Protector (Braille), Depth Gauge : its demonstration.	Construction & working Principle of Angle Protractor & depth gauge.
15.	Demonstration of marking tools.	Odd-leg caliper, Scriber, Divider (Spring-joint), different kinds of hammer, surface plate, divider – kinds & uses.
16.	Use different kinds of Hammer and Punch.	Measurement – steel rule – different types Theory of Hardware and punch – type uses.
17.	Filing Practice on Plain surfaces, Draw filling use of calipers and scale measurement.	Vice – types and uses. Files – different types of uses, cut, grade, shape materials etc. Try square – different types, parts, material used etc. calipers – types and uses.
18.	Filing at right angle, hack sawing	Vee-block, scribing block, and its uses. Hacksaw – Their types & uses, different blades
19.	Drilling operations under bench and Pillar Drill.	Drill machine : different kinds, different parts and function. Nomenclature of drill bit.
20.	<p>Drilling with the help of Jigs and fixtures under Radial Drill machine.</p> <p>Threading with the help of taps and dies Sheet Metal working – folding, bending, forming of cylindrical job, using stakes, mallet &amp; ‘C’ clamps.</p>	<p>Different kinds of jigs and fixtures and their uses.</p> <p>Tap &amp; Die – their different types and uses. Calculation involved finding out drill size.</p> <p>Sheet Metal Terms such as folding, bending, forming of cylindrical job, different kinds of stakes.</p>
21.	Sheet Metal working – folding, bending, forming of cylindrical job, using stakes, mallet & ‘C’ clamps.	Sheet Metal Terms such as folding, bending, forming of cylindrical job, different kinds of stakes.

22.	Riveting Joints (Manual Practice).	Rivets & its parts, types & usage. Riveting tools like Pop Rivet Gun use on aluminum sheet.
23-25	<b>Revision</b>	
26	<b>Examination</b>	

**SYLLABUS FOR CRAFT, SCIENCE AND CALCULATION**  
**SEMESTER-I**

Week No	Craft, Science and Calculation
1-3	Acquaintance with raw material. Introduction and use of tools.
4	Manufacture of bags. Rope work life bags, doormat.
5-7	Bamboo crafts like basket, morah etc.
8	Caning and Re-caning of chairs.
9	<u>BOOK BINDING.</u> Introduction of various equipment and Raw materials for Book Binding. Description on size and nature of paper and other raw material needed
10	Stitching of various natures and sizing papers.
11	Binding of writing Pads Binding of Books.
12	Introduction of Properties and uses of C.I. & W.I., M.S. & Stainless Steel.
13	Arithmetic : Fundamental Operation, addition, subtraction, multiplication and division of decimals number.
14	Properties and uses of plain carbon steel and alloy steel.
15-16	Properties and uses of copper, zinc, lead, tin, aluminum.
17-18	Composition, properties and uses of brass, bronze, solder and other alloys.
19	System of units, British, metric & SI units for length area, volume, capacity, weight time angle, their conversation.
20-21	Effect of alloying elements on the property of CI and steel
22	Units of temperature & conversion of different system of temperature and related problems.
23-25	Revision
26	Examination

**SYLLABUS FOR MOBILITY & DAILY LIVING**  
**SEMESTER-I**

Week No	Mobility & Daily Living
1-2	Concept of Orientation & Mobility – purpose, differences, Technique of Orientation, Importance/ Role of Orientation & Mobility. Concept of Turns/Training Concept of Sides
3	Concept of steps (Space, surface, distance, routes stairs etc.) Concept of Direction, concept of straight line, balance, broad line, body motion, speeds row etc.  Straight line walking (support & without support)
4	Development of Self confidence, Concept formation & body fitness.  Environmental Awareness & source identifications, Orientation of Hostel, class-room, workshop, campus etc.
5	Different types of Trailing & uses upper & lower body protection techniques. Square off/Lining shore line/Alternating Shore Line  Land Marks, clues (Identification & difference between LM & CL).
6	Veering wrist movement & leg Movement Therapy.  Cane Techniques (Pre & Basic care Techniques, Rules of using Care etc.)  Blind Fold & its use.
7	Sensory Training (Auditory, Perception, sense of touch etc.) Sound (Concept, use, source etc.).
8	Mobility Maps and Map Reading Sighted Guide/Human Guide Technique.  Following Techniques (verbal & non-verbal) Sitting position & Techniques.
9	Staircase Techniques, Safety Techniques & Education Searching or Finding the object/Drop the object.  Tactics to overcome the Road obstacles, Precaution of working regarding in the workshop floor. Concept of Dog Guide Techniques, knowledge of Electronic Travel Aids & Appliances.
10	<u>Daily Living</u> : Personal hygiene & cleanliness, use & care of dresses.
11	Dinning manners  Arranging beddings.
12	Input devices and output devices.
13	Concept of Bit, Byte, K.B., M.B., G.B.



14	Full Form and concept of C.P.U.,RAM, ROM, HOD, FOD, CD etc.
15-19	Keyboard Orientation
20	Assessment Typing with the help of JAWS
21-22	Typing with the help of JAWS
23-25	<b>Revision</b>
26	<b>Examination</b>

## SYLLABUS FOR EMPLOYABILITY SKILLS

### SEMESTER-I

<b>1. I.T. Literacy</b>	
<b>Hours of Instruction : 20 Hrs.</b>	<b>Marks Allotted : 20</b>
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 Common 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.
<b>2. English Literacy</b>	
<b>Hours of Instruction: 15 Hrs.</b>	<b>Marks Allotted : 15</b>
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.
<b>3. Communication skill</b>	
<b>Hours of Instruction: 15 Hrs.</b>	<b>Marks Allotted : 15</b>
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 behavior in an interview, Do's and don'ts
Behavioral Skills	Attitude, Problem Solving, Thinking Skills, Confidence building

**Second Semester**  
**(Semester Code no. MCA-V/I - 02)**  
**Duration: Six Months**

<b>WEEK NO.</b>	<b>MOTOR SKILL TRAINING PROGRAMME</b>	<b>TRADE THEORY</b>
01.	Getting to know the lathe with its main components, lever position and various lubrication points as well.	Definition of machine & machine tool and its classification. History and gradual development of lathe.
02.	Mounting of chuck on machine spindle and unloading various systems.	Classification of lathe in function. Construction of different parts of lathe & its safety precautions.
03.	Use of 3-jaw self centering chuck.	Types of lathe drivers, merit and demerit, Description in details – headstock – cone pulley type – all geared type construction & function.
04.	Use of Driving plate, lathe dog, center to center job setting.	Reducing Speed-necessary & uses of speed calculation.
05.	R.H. and L.H. cutting tools checking of angles with tools angle gauge.	Theory of Driving plate, lathe dog, kinds of centre – their use functions of Tail Stock.
06.	Setting of lathe tools in different types of tool post following correct procedure.	Lathe cutting tool – different types, shapes and different angles (clearances and rakes) Specification of lathe tools.
07.	Facing operation to correct length, centre drilling operation.	Different types of lathe tool posts, Function of quick change gear box feed shaft, lead screw etc.
08.	Parallel turning practice – measurement with scale and caliper, then ‘GO’ – ‘NO GO’ Limit Gauge.	Combination drill – Drill chuck – its uses, Cutting speed, depth of cut, calculation involved – speed, feed, R.P.M. etc. recommended for different materials.
09.	Step turning with scale and caliper $\pm 1/64$ “ Parallel turning Practice measurement with Braille micrometer $\pm 0.001$ ” accuracy.	Vernier caliper – its construction, principle but measure with scale and spring caliper  Outside micrometer – different parts, principle, graduation, reading construction.
10.	Step turning practice with in $\pm 0.001$ ” with SQ. Shoulder, Under cut, feel of micrometer, Sources of error with micrometer.	Different types of micrometer, sources of error with micrometer and how to avoid them.
11.	Drilling on lathe -step drilling.	Lathe accessories; chuck self centering, collets, its function, construction and uses.

12.	Boring Practice – plain. Use of inside caliper. Bore plain, measurement with transfer caliper $\pm 0.0625$ ” or $\pm 1/64$ “.	Drills: Different parts, types, sizes etc. different cutting angles cutting speed for different material, Boring tool – core drill. Letter and number drill, core drill etc. transfer calipers : construction on uses.
13.	Boring plain & step checked by bore gauge.	Driving plate, Face plate & fixed & travelling steadies. Construction and uses.
14.	Checking alignment of Lathe Centers. Reaming by setting job in vice using solid reamer.	Lathe Centers – types and their uses lathe carrier-function, types & uses. Reamers – types and uses, lubricant and coolant – types, necessity system of distribution, selection of coolant for different material, handling and care.
15.	Knurling Practice in lathe.	Knurling measuring, necessity, types, grade, cutting speed for knurling.
16.	Turning Practice between centers on mandrel.	Lathe mandrel – different types and their uses.
17-18.	Fitting of Dissimilar materials – H.S.S in brass, aluminum in cast Iron etc.	Concept of interchangeability, Limit, Fit and tolerances, Fits-different types, hole basis & shaft basis etc.
19.	Taper turning by swiveling compound rest.	Taper turning by swiveling compound slide, its calculation, advantages & disadvantages.
20.	Taper turning by taper turning attachment, practice (External only). Taper turning by form tool (External).	Taper turning: Principle setting, advantages & disadvantages. Different types of form tool & uses.
21.	Buffing & polishing practice on MS, stainless steel, non-ferrous metal & Lacquering.	Buffing machine & wheels, its uses, lacquering material. Dies: different types, Die Stock. Electro-plated materials, brass, bronze & aluminum for polishing work.
22-25	<b>Revision</b>	
26	<b>Examination</b>	

**Second Semester**  
**SYLLABUS FOR WORKSHOP CALCULATION & SCIENCE**  
**(Semester Code no. MCA-V/I - 02)**  
**Duration: Six Months**

WEEK NO.	WORKSHOP CALCULATION & SCIENCE
01-2.	Mass, volume, density, specific gravity & specific weight- S.I., M.K.S. and F.P.S. units of force, weight etc. their conversion & related problems.
03.	Inertia, rest and motion, velocity and acceleration.
04.	Newton's Law of motion.
05-6	Power and Roots factor, power, base exponents.
07.	Multiplication and division of power and root of a number.
08-9	Square root by arithmetic and problems.
10-11.	Work, energy and power, their units – related problems.
12.	H.P., I.H.P. and B.H.P. Efficiency and related problems. Percentage, Changing Percentage to decimal and vice-versa.
13.	Problem on percentage related to trade.
14.	Measuring of stress, strain, modules of elasticity.
15-18	Ultimate strength, different types of stress, factor of safety and examples. Ratio and Proportions and related problems
19.	Fundamental Algebraic Operations: Symbols used in Algebra.
20.	Power of Laws of exponent.
21.	Simple machine like winch, pulley couplings etc.
22&23	<b>In-plant training</b> / Project work (work in a team)
24	Revision
25	Examination

**Second Semester**  
**SYLLABUS FOR MOBILITY & DAILY LIVING**  
**(Semester Code no. MCA-V/I - 02)**

**Duration: Six Months**

<b>WEEK NO.</b>	<b>MOBILITY &amp; DAILY LIVING</b>
01.	Typing with the help of JAWS
02.	Typing with the help of JAWS
03.	Assessment
04-07.	Windows Basics
08.	Assessment
09-12.	Microsoft Word basics
13-14.	Windows Basics
15-18	Microsoft Word commands
19.	Assessment
20-21.	Shortcut Keys
22&23	<b>In-plant training / Project work (work in a team)</b>
24	Revision
25	Examination

**SYLLABUS FOR EMPLOYABILITY SKILLS**  
**SEMESTER-II**

<b>1. Entrepreneurship skill</b>	
<b>Hours of Instruction : 10 Hrs.</b>	
<b>Marks Allotted : 10</b>	
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
<b>2. Environment Education</b>	
<b>Hours of Instruction: 10 Hrs.</b>	
<b>Marks Allotted : 10</b>	
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.
<b>3. Occupational Safety, Health &amp; Environment</b>	
<b>Hours of Instruction: 10 Hrs.</b>	
<b>Marks Allotted : 10</b>	
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
<b>4. Labour Welfare Legislation</b>	
<b>Hours of Instruction : 10 Hrs.</b>	
<b>Marks Allotted : 10</b>	
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
<b>5. Quality Tools</b>	
<b>Hours of Instruction : 10 Hrs.</b>	
<b>Marks Allotted : 10</b>	
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	Idea of ISO 9000 and BIS systems and its importance in maintaining

System	qualities.
House Keeping	Purpose of Housekeeping, Practice of good Housekeeping.5S Principles of Housekeeping: SEIRI – Segregation, SEITON – Arrangement, SEISO – Cleaning, SEIKETSU – maintenance of Standards, SHITSUKE - Discipline



**Third Semester**  
**(Semester Code no. MCA-V/I - 03)**  
**Duration : Six Months**

<b>WEEK NO.</b>	<b>MOTOR SKILL TRAINING PROGRAMME</b>	<b>TRADE THEORY</b>
01.	Use Die, Practice on thread (External) non Ferrous metal, BSF thread.	Dies : different types, Die stock (BSF thread).
02.	Use Taps Practice on thread (Internal), Non-Ferrous metal (BSF thread).	Taps: different types, Tap wrenches (BSF thread).
03.	Fitting of male and female threaded components.	Calculation involved depth, core dia., pitch proportion.
04.	Square and round groove cutting in lathe.	Groove tool and their uses, calculation & speed of job held in between centers.
05.	Taper turning by Taper turning attachment(External).	Template – Purpose & use. Checking taper by gauge.
06.	Introduction to various components produced on lathe.	Review of lathe machine, its classification for productivity.
07.	Turning & boring practice on C.I. block  Periodical lubrication procedure on lathe, testing of accuracy of alignment. Preventive maintenance of lathe.	Method of brazing solder, flux used for tip tools.  Preventive maintenance, its necessity, frequently of lubrication, TPM (Total Productive Maintenance). E.H.S. (Environment, Heats, Safety).
08.	Turning of long shaft (using steadies).	Steady and follower rest
09.	Use of attachments on lathe for different operations.	Different types of attachment used in lathe.
10.	Setting and operation involving face and Angle plate.	Accessories used on face plate – their uses. Angle plate – its construction & use.
11.	Operation in capstan lathe with three-jaw chuck.	Capstan lathe – construction & working principle with safety precaution.
12.	Operation in Capstan lathe with collet chuck.	Difference between center and capstan lathe.
13.	Producing (3/8”) nut in capstan lathe (without thread).	Principle of cutting Nut: drilling, chamfering and parting.
14.	Power saw machine Blade Setting.	Power saw: Construction, Construction different kinds of blade use in it.

15.	Job setting on vice and coolant supply.	Working principle of power saw with its safety precaution.
16.	Round Rod cutting in various sizes.	Size, Teeth of blade and its adjustment.
17.	Practice cutting of MS bar as well as sheet	Quick return mechanism
18	Ball Press Practice.	Description of Fly Press/Ball Press, Operating Principle of power press with safety precaution.
19.	Conveyer Belt – its demonstration. Working Practice on conveyer belt.	Necessity of conveyer belt & its construction. Different types of conveyer belt use in industry due to production purpose.
20.	Shearing Machine Demonstration.	Construction & working principle of shearing.
21	Stopper adjustment and shearing practice on sheets.	Principle of using the blade & safety.
22&23	<b>In-plant training</b> / Project work (work in a team)	
24	Revision	
25	Examination	

**Third Semester**  
**(Semester Code no. MCA - 03)**

**Duration : Six Months**

**SYLLABUS FOR WORKSHOP CALCULATION & SCIENCE**

<b>WEEK NO.</b>	<b>WORKSHOP CALCULATION &amp; SCIENCE</b>
1-02.	Specific gravity – Principle of Archimedes.
03.	Relation between specific gravity & specific unit.
04.	<u>Geometry</u> : Fundamental geometrical definition of angle and properties of triangle.
05.	Pythagoras Theorem, Properties of Similar triangle.
06.	--do--
07-8.	Solid figures – Prism, Cylinder, Pyramid, Cone.
09.	Material weight and problem related to trade.
10.	Trigonometry : Trigonometrical ratios, use of trigonometrical tables.
11.	Area of triangle by trigonometry.
12	Finding height and distance trigonometry.
13.	Application of trigonometry to related problems.
14.	Triangle of forces.
15.	Parallelogram of forces.
16.-17	Composition and resolution of force.
18	Moment of a force couples, simple problem on straight and bell crank lever.
19.-20	Centre of gravity simple experimental determination.
21	Friction – co-efficient of friction.
22&23	<b>In-plant training</b> / Project work (work in a team)
24	Revision
25	Examination

**Third Semester**  
**(Semester Code no. MCA-V/I - 03)**

**Duration : Six Months**

**SYLLABUS FOR MOBILITY & DAILY LIVING**

<b>WEEK NO.</b>	<b>Contents</b>
01-7.	Shortcut Keys
08.	Assessment
09-18	File Management
19.	File Management and Assessment
20-21	CD operating
22&23	<b>In-plant training</b> / Project work (work in a team)
24	Revision
25	Examination

**Fourth Semester**  
**(Semester Code no. MCA(V/I) - 04)**  
**Duration : Six Months**

<b>WEEK NO.</b>	<b>MOTOR SKILL TRAINING PROGRAMME</b>	<b>TRADE THEORY</b>
01.	Setting machine vice on the table of shaper.	Shaper: Construction, its parts, accessories & safety precaution.
02.	Checking stroke length of shaper.	Shaper: Working Principle.
03.	Different tool setting according to stroke length.	Kinds of shaper tools, their uses.
04..	Plain surface on C.I. block in shaper.	Automatic feed mechanism.
05	--do--	Quick return mechanism of shaper
06.	Plain surface on MS Plate.	--do--
07.	Square Slot Practice on MS Plate.	Kinds of tools use for slot cutting.
08.	Vee-slot practice on C.I. Block.	Tool adjusts on RAM, job setting & stroke length adjustment.
09.	Key way Practice on a shaft end – demonstration only.	Kinds of key ways formed on shaft end & coupling fitting. Related Theory.
10.	Square Shape practice on round head bolt.	Job sequence of bolt forming, stroke length adjustment & square shaped formed.
11	Maintenance of Shaper.	Theory of maintenance of Shaper.
12.	Milling Operations and vice setting on table.	Basic parts & safety precautions of Milling.
13.	Setting different types of tools on Arbor with spacer.	Milling: Working principle & adjustment of work in Vice.
14.	--do--	Different kinds of milling cutters and their uses.
15.	Practice plain surface on MS Plate by up milling.	--do--
16.	Step Milling using side and face cutter.	Up milling.
17.	Plain surface on CI Block by down Milling – only demonstration.	Down milling – Necessity & limitation.
18-19.	Square slot practice on MS plate with side and face cutter.	Difference between up milling & down milling.
20.	V-shape slot practice on CI block.	V-shape slot formed by side and face cutter, job adjusting with the help of V-block & vice.

21.	Maintenance of Milling Machine.	Theory on Milling Machine maintenance.
22&23	<b>In-plant training</b> / Project work (work in a team)	
24	Revision	
25	Examination	

**Fourth Semester**  
**(Semester Code no. MCA(V/I) - 04)**

**Duration : Six Months**

**SYLLABUS FOR WORKSHOP CALCULATION & SCIENCE**

<b>WEEK NO.</b>	<b>WORKSHOP CALCULATION &amp; SCIENCE</b>
01-2.	Simple Problems related to friction.
03.	Magnetic substances natural and artificial magnets.
04.-5.	Methods of magnetization – uses of magnets
06-7	Electricity & its uses, electric current positive & negative terminals.
08.	Use of fuses and switches, conductors and insulators.
09-10.	Ohm's law – simple calculation, electrical insulating materials.
11	Mechanical properties of metals.
12.	Heat treatment of steel.
13-14	Hardening & tempering.
15.	Annealing.
16.	Normalizing.
17-18.	Case hardening : Standard and measurement.
19.	Carburizing, Flame hardening etc.
20-21.	Calculation of cutting feed in lathe machine.
22&23	<b>In-plant training</b> / Project work (work in a team)
24	Revision
25	Examination

**Fourth Semester**  
**(Semester Code no. MCA(V/I) - 04)**  
**Duration : Six Months**  
**SYLLABUS FOR MOBILITY & DAILY LIVING**

<b>WEEK NO.</b>	<b>MOBILITY &amp; DAILY LIVING Content</b>
01-3.	CD operating
04..	Assessment
05-12	Concept & MS Excel
13.	Assessment
14-19.	Concept of Internet
20.	Assessment and Practice
21.	Practice
22-23	<b>In-plant training</b> / Project work (work in a team)
224-25	Revision
26	Examination



## LIST OF TOOLS & EQUIPMENTS FOR 10 TRAINEES

### A : Trainee's Tool Kit :

SL No.	Name and Description of the items	For Instructor	For Trainees
01	Caliper out side firm and spring-joint 150mm.	1 No.	10 Nos.
02	Caliper inside firm and spring-joint 150mm.	1 No.	10 Nos.
03	Caliper odd-leg firm-joint 150mm.	1 No.	10 Nos.
04	Divider spring-joint 150mm.	1 No.	10 Nos.
05	Scriber 150mm. X 3mm.	1 No.	10 Nos.
06	Center punch 100mm.	1 No.	10 Nos.
07	Dot Or Prick Punch 100mm.	1 No.	10 Nos.
08	Hammer (Ball pein, Cross pein and straight pein) 250GM.	1 No.	10 Nos.
09	Steel Rule 150mm. (Braille type 6inch size with 160inch division)	1 No.	10 Nos.

### B: Tools and Equipments:

SL No.	Name and Description of the items	Quantity
01	Surface plate 60 X 60cm.	01 no.
02	Marking Table 120cm. X 90cm. X 30cm.	01 no.
03	Vee-block 75 and 125mm. with clamp.	01 no. each
04	Hand punch	2 Nos.
05	Wooden Hammer	4 No.
06	Hack saw fixed 250mm.	4 No.
07	File Flat 300mm. rough	4 No.
08	File Flat 250mm. 2 <sup>nd</sup> cut	6 No.
09	File Flat 150mm. smooth	4 No.
10	File Flat 250mm. smooth	2 No.
11	File Half round 250mm. 2 <sup>nd</sup> cut	4 Nos.
12	File half round 150mm. smooth	4 Nos.
13	File round 250mm. smooth	2 Nos.
14	File Knife 250mm. smooth	2 Nos.
15	Screw driver 150mm and 200mm. shank	2 set
16	Spanner double ended 6mm. to 21mm.	2 set
17	Spanner adjustable 200mm.	2 Nos.
18	Pliers flat nose 150mm.	2 No
19	Caliper Transfer out side 150mm.	1 No.
20	Micro meter out side 0 to 1 inch (Braille System 0.001 inch)	1 No.
21	Depth gauge (Braille System)	1 No.
22	Angle Protractor reading 5 degree multipliers upto 180 degree	1 No.
23	"Go-No Go" Gauge (1/4 inch to 1/2 inch)	1 each
24	Try square 150mm. blade	6 No.
25	Feeler gauge 0.002 inch thick	6 Nos.
26	Fitter bench vice	10 Nos.
27	Machine vice 100mm.-jaw (for drill machine)	2 Nos.
28	Twist drill straight shank 7/64 inch to 3/8 inch	1 set
29	Twist drill taper shank 7/16 inch	2 No.
30	Tap and die BSW up to half inch	2 set
31	Tap and die Metric set up to 12 mm	2 set

32	Morse Taper Sleeves NO. 0-1, 1-2, 2-3, 3-4	1 set
33	Drill Chuck 12mm. capacity with key	2 Set
34	Drill Chuck 25 mm capacity with key	2 set
35	Reamer straight flute 6 to 12mm.(3/16 inch to 7/16 inch)	2 sets
36	Reamer adjustable 7/16 inch	1 No.
37	Tool holder RH and straight for square tool bit	1No.
38	Parting tool holder with HSS blade	4 Nos.
39	Oil can 1/2pint (Pressure feed system)	4 Nos.
40	Boring tool Holder for 6mm. square tool bit	2 Nos.
41	Angle plate with slots 200mm.	2 Nos.
42	Oil stone 12mm. square 100mm long	2 Nos.
43	Tap wrench (adjustable)	6 Nos.
44	Box wrench	1 set
45	Die handle	3 Nos.
46	Tool Bit assorted sizes on holder	1 No.
47	Grinding wheel (150mm. dia)	2 Nos.
48	Almirah 1980 X910 X480 mm.	2 Nos.
49	Steel Locker with drawer	1 No.
50	Angle gauge for tool grinding	2 Nos.
51	Desk	1 No.
52	Stools	5 Nos.
53	Revolving center (2 suit Lathe tail stock)	2 Nos.
54	Bore Gauge (plane and stepped)	2 sets.
55	Wheel Dresser diamond (inserted 0.75 or 1 carat)	2 Nos.
56	Gauge drill grinding	1 No.
57	Tool Holder for shaper with bit	2 Nos.
58	Cylindrical cutter (shell) 3 inch dia X3 inch length	2 Nos.
59	Side and face cutter for milling ½ inch X 2.5 inch and ¾ inch X2.5 inch	1+1 Nos.
60	Slitting saw cutter 4 inch dia X 1/32 inch + 4 inch dia X 1/16 inch	1 set.
61	Shearing Machine Blade 75cm.	1 No.
62	Hacksaw blades (18 TPI) 250mm.	10 Nos.
63	Center gauge com. 60 degree, 55 degree and 29 degree	2 Nos.
64	Screw pitch gauge wit worth and Metric each	2 Nos.
65	Dial test Indicator 0.01mm. with Magnetic base	2 Nos.
66	Spirit Level 0.05 meter	2 Nos.
67	Buffing wheels with material	2 Nos.
68	Snips Straight 250 mm.	4 Nos.
69	‘C’ clamp 150 mm.	2 Nos.
70	Lazy Tong	2 Nos.
71	Conductor stake	4 Nos.
72	Rivet sets snap & dolly combined 3 mm.	4 Nos.
73	Fire Extinguisher and buckets	2 Nos.

**NOTE :-**

1. As trainees are visually challenged persons, additional item may be required according to their necessity.
2. Inch scale is provided for them as suitable because they can measure with their nail as a least count 1/16 inch which may be considered 1.5mm.

3. Drawing and marking are impossible for them.
4. For drilling purpose jigs and fixtures are suitable for them.

**c: General Machinery & Installation:**

SL No.	Machinery and Equipments	Quantity
01	Lathe (all geared head stock) 18cm center height to admit 90cm between centers. Machine to be motorized to H.P. and supplied with coolant installation, 4-jaw independent chuck 250mm 3-jaw self-centering chuck 160mm. fixed steady rest, face plate driving plate follower rest 4-way tool post live and dead centers with taper turning attachments.	1 No.
02	Lathe (step pulley type) 16cm. center height 120cm. between centers gapped machine to be motorized 4-jaw independent chuck 300mm. 3-jaw self centering chuck 200mm. 4-way tool post live and dead center with taper attachments.	2 Nos.
03	Lathe (step pulley bench type) 7cm. center height 40cm. between centers motorized 3-jaw self centering chuck, fixed steady and follower rest, face plate, driving plate, single tool post, live and dead center with taper attachments.	2 Nos.
04	Pedestal Grinding machine power driven 180mm. dia wheel guard and vision guard.	1 No.
05	Drill machine pillar type motorized upto 30mm. capacity.	1 No.
06	Radial drill machine motorized (1H.P.) upto 25mm. capacity.	1 No.
07	Universal Milling machine head Motor 1.5H.P. dividing head 150mm. 250mm. rotary table, 150 mm. Milling Vice with cutters and spacers.	2 No.
08	Capstans Lathe – Motorized (3H.P.) 160mm. 3-jaw chuck and collets 40mm. capacity.	1No.
09	Capstan Lathe – motorized (1H.P.) with collets 12mm. capacity.	1No.
10	Conveyer belt ( 18 inch width) with brake drum (15 inch dia * 18 inch L) and motor 3H.P.	1No
11	Power saw machine – Hydraulic feed system 400mm. blade size.	1 No.
12	A shaper Motorized 30cm. stroke length 2 H.P. motor.	2 No.
13	Shearing machine 75cm. capacity motorized 3H.P.	1 No.
14	Buffing & Polishing machine with $\frac{1}{2}$ H.P. motor and 6” dia wheels	1 No.
15	Pop rivet gun (Manual)	1 No.
16	Ball Press	1 No.
17	Computer with JAWS & UPS	10 nos

**LIST OF TRADE COMMITTEE MEMBERS**

Sl. No.	Name & Designation Sh/Mr/Ms.	Organization	Mentor Council Designation
<b>Members of Sector Mentor council</b>			
1.	A. D. Shahane, Vice-President, (Corporate Trg.)	Larsen & Turbo 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
<b>Mentor</b>			
21.	Sunil Kumar Gupta (Director)	DGET HQ, New Delhi.	Mentor
<b>Members of Core Group</b>			
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
<b>Other industry representatives</b>			
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