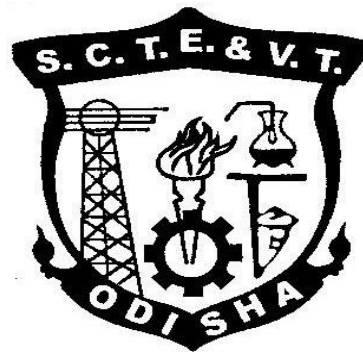


**CURRICULUM OF
LEVEL 04; 3rd SEMESTER**

For

**DIPLOMA VOCATIONAL IN
INDUSTRIAL TOOL MANUFACTURING**

(Effective FROM 2021-22 Sessions)



**STATE COUNCIL FOR TECHNICAL EDUCATION & VOCATIONAL TRAINING,
ODISHA, BHUBANESWAR**

STATE COUNCIL FOR TECHNICAL EDUCATION AND VOCATIONAL TRAINING, ODISHA								
TEACHING AND EVALUATION SCHEME FOR LEVL 04: 3rd Semester (D.Voc in Industrial Tool Manufacturing) (wef 2021-22)								
Sl. No.	Subject Code	Subject	Total hours/semester		Credit		Marks in Evaluation Scheme	
			L	P	T	P	Exams (Hours)	Total Marks
		Theory						
1	Th.1	Language-II	45	-	3	-	2	50
2	Th.2	IT Tools	45	-	3	-	2	50
3	Th.3	Manufacturing Technology - I	45	-	3	-	2	50
4	Th.4	Engineering Science	45	-	3	-	2	50
		<i>Total</i>	<i>180</i>		<i>12</i>			<i>200</i>
		Practical						
5	Pr.1	Mechanical Workshop Practice - I		45		1.5	3	50
6	Pr.2	IT Tools Lab		45		1.5	3	50
		<i>Total</i>		<i>90</i>		<i>03</i>		<i>100</i>
		On-Job-Training (OJT)						
7		CNC Operator – Turning (CSC/Q0115) OR Operator – Surface Grinding machines (CSC/Q0109) OR Fitter – Mechanical Assembly (CSC/Q0304) OR Draftsman – Mechanical (CSC/Q)		230		15	-	200
		<i>Total</i>		<i>230</i>		<i>15</i>		<i>200</i>
		Grand Total	180	320	12	18		500
Abbreviations: L-Lecturer, T-Tutorial, P-Practical. Each class is of minimum 60 minutes duration								
		Evaluating Agency / Body					Passing Marks	
Theory		State Council of Technical Education & Vocational Training, Odisha					35%	
Practical		SCTE&VT/ Institute / Skill Knowledge Provider (SKP) / Training Partner					50%	
On-job Training (OJT)		Concerned Industry (where On-job Training was undergone by the student)					50%	

TH.1. LANGUAGE – II

Theory	3 Periods per week	Examination	2hours
Total Periods	45 Periods	Total Marks	50 Marks

Topic Wise Distribution of Periods

Sl. No.	Topic	Periods
1	Listening and speaking skills	30
2	English for Science OR	50
3	English for Receptionist OR	50
4	English for Office Use	50

DETAILED CONTENTS

1.0 Listening and speaking skills:

- In this module the learners will be exposed to a variety of listening activities recorded on audiotapes. These will be samples of good spoken English, which the learners can use as models. Work sheets will accompany the listening material.
- This module will include the following:
 1. Introducing yourself/friends in formal and informal situations.
 2. Inviting people (over the phone and face to face) giving details of occasion, time place and date. Acceptance and refusal of invitation – formal and informal.
 3. Seeking and supplying information (example opening an account in a bank, applying for loans etc.)
 4. Talking and conveying messages (over the phone and face to face).
 5. Giving directions / instruction.
 6. Discussing contemporary issues related to environment, child labour, gender bias etc.
 7. Listening to excerpts from television and radio.
 8. Listening to poems/plays (prescribed).
 9. Listening to speeches / talks.
 10. Listening to songs like “We shall overcome”.

OPT ANY ONE OF THE BELOW MODULE 02 OR 03 OR 04

2.0 English for Science:

- This course will introduce learners to some interesting pieces of popular science
 1. Health and hygiene
 2. Conservation of (nearly extinct) animals.
 3. Plant life.
 4. Bio gas / solar energy.
- These pieces illustrate the use of English in scientific writing: giving information factually, logically and objectively.

3.0 English for Receptionist:

- This module will introduce the learners to a variety of exercises, tasks and meaningful activities related to the receptionist’s use of English. The printed course materials will be supported by tapes.
- The following competencies be developed:
 1. Receiving messages, making request etc.
 2. Supplying information
 3. Giving advice and making suggestions
 4. Dealing with complaints
 5. Making entries in an appointment book, register etc.

4.0 English for Office Use:

- This course will help the learner to use English effectively and appropriately in the office environment. The competencies will be developed.
 1. Using the telephone taking and passing messages.
 2. Receiving messages
 3. Marking noting on files and circular.
 4. Writing office notes, memos, notices, agendas for meetings.
 5. Telegrams and fax messages.
 6. Writing business letters, application enquires, complaints.
 7. Filling in forms, cheques, pay in slips etc.

Syllabus to be covered before IA: Chapter 1

RECOMMENDED BOOKS

1. Effective Communication Skills, Kulbhushan Kumar, Khanna Publishing House
2. Business Communications, Varinder Bhatia, Khanna Publishing House

TH.2. IT TOOLS

Theory	3 Periods per week	Examination	2hours
Total Periods	45 Periods	Total Marks	50 Marks

Topic Wise Distribution of Periods

Sl. No.	Topic	Periods
1	Computer Organization & OS: User perspective	8
2	Networking and Internet	7
3	Office automation tools	8
4	Multi Media Design: (Open Source Design Tools)	7
5	Troubleshooting: Hardware, Software and Networking	8
6	Work Integrated Learning IT – ISM	7

DETAILED CONTENTS

1.0 Computer Organization & OS: User perspective:

- Understanding of Hardware
- Basics of Operating System

2.0 Networking and Internet:

- Network Safety concerns
- Network Security tools and services
- Cyber Security
- Safe practices on Social networking

3.0 Office automation tools:

- Spreadsheet
- Word processing
- Presentation

4.0 Multi Media Design: (Open Source Design Tools)

- Interface and Drawing Tools in GIMP
- Applying Filters
- Creating and handling multiple layers
- Using Stamping and Smudging tools
- Importing pictures

5.0 Troubleshooting: Hardware, Software and Networking

- Commonly encountered problems
- (Monitor: No display, KB/Mouse not responding, monitor giving beeps, printer not responding, check for virus, Delete temporary files if system is slow, adjust mouse speed)

6.0 Work Integrated Learning IT – ISM:

- Identification of Work Areas
- Work Experience

Syllabus covered up to I.A-Chapters 1, 2 &3

RECOMMENDED BOOKS

1. IT Tools, R.K. Jain, Khanna Publishing House
2. Information Security & Cyber Laws, Sarika Gupta, Khanna Publishing House
3. Mastering PC Hardware & Networking, Ajit Mittal, Khanna Publishing House

TH.3. MANUFACTURING TECHNOLOGY –I

Theory	3 Periods per week	Examination	2hours
Total Periods	45 Periods	Total Marks	50 Marks

Topic Wise Distribution of Periods

Sl No.	Topic	Periods
1	General Introduction	2
2	Carpentry	5
3	Joining of Timber Components for Fabrications Works	5
4	Metal Shaping-Smithy	5
5	Sheet metal working-Tools and operation	5
6	Metal Joining During Fabrication	5
7	Riveting	5
8	Familiarity with the Use of Various Tools Used in Mechanical Engineering Workshop	3
9	Protection of Fabricated Structures From Weather	5
10	Foundry Work	5

DETAILED CONTENTS

1.0 General Introduction:

- Understanding (a) Scope of subject "Workshop Technology" in engineering (b)
- Different shop activities and broad division of the shops on the basis of nature of work done such as (i) Wooden Fabrication-carpentry (ii) Metal Fabrication (shaping and Forming, Smithy, sheet metal and Joining-welding, Riveting, Fitting and Plumbing)

2.0 Carpentry:

- Fundamental of wood working operations
- Common Carpentry Tools- Their classification, size, specification (name of the parts and use only): (i) Marking and measuring tools (ii) Holding and supporting tools: (iii) Cutting and Sawing Tools: (iv) Drilling and Boring Tools (v) Striking Tools-Mallet and Claw hammer (vi) Turning Tools & Equipment (vii) Miscellaneous Tools

3.0 Joining of Timber Components for Fabrications Works:

- Assembly of joints (Preparation steps and tools used only)
- Mortise, Tenon, Rivet, Groove, Tongue, Dowel, operations in assembly-simple lap and butt, Mortise, Tenon, Dovetail, Miter & bridle joints
- Metal Fabrication

4.0 Metal Shaping-Smithy:

- Operations involved (concept only)
- Tool and equipment used (Names, size, specification for identification only)
- Heating and fuel handling equipment
- Holding and supporting tools, Striking Tools, Cutting tools, Punching & Drifting Tools, Bending Tools and figures, Forming & Finishing Tools
- Defects Occurring & its remedy

5.0 Sheet metal working-Tools and operation:

- Operations involved (Names and concept only)
- Sheet metal joints
- Tools and equipment used (Name, size, specifications for identification only), Marking tools, Cutting and shearing Tools, Straightening tool, Striking Tools, Holding Tools, Supporting Tools, Bending tools, Punching-Piercing and Drafting tools, Burring Tools-

Files

- Defects Occurring & its remedy

6.0 Metal Joining During Fabrication:

- Permanent Joining: Welding methods, Electric welding
- Soldering & Brazing: Its concept, comparison with welding as joining method and classification, Soldering operation, Materials Used, Defects Occurring & its remedy

7.0 Riveting:

- Its comparison with welding as joining method
- Rivets and Materials
- Operation involved
- Tools and equipment used (Names, Size, specification and uses)),
- Elementary knowledge about working of pneumatic, hydraulic and electric riveter
- Temporary Joining (Fasteners & their uses), General Idea about temporary fasteners & their uses

8.0 Familiarity with the Use of Various Tools Used in Mechanical Engineering Workshop:

- Marking & Measuring Tools, Holding Tools, Cutting Tools, Files, Thread Cutting Tools, Miscellaneous Tools
- They should be shown physically to each student for familiarity

9.0 Protection of Fabricated Structures From Weather:

- Painting: Its need, Introduction to methods of painting (classification only) operations involved description steps only, surface preparation materials, tools and equipment used (name, size specification for identification), Brushes-round and flat wire brush, scraper, trowel, spray gun, compressor, Defects likely to occur in painting and their remedies
- Varnishing & Polishing: Its need, operation involved (description of steps only), surface preparation method of old and new articles, application of polishing materials, materials used for preparation of french and sprit polish, copal varnish, Defects likely to occur.
- Safety of Personnel, Equipment & Tools to be observed

10.0 Foundry Work:

- Elementary idea of patterns, green sand moulds and moulding, tools and equipment used in green sand moulding

Syllabus covered up to I.A-Chapters 1,2,3,4 &5

RECOMMENDED BOOKS

1. Workshop Technology, Vol. I: Hazra & Chaudhry
2. Workshop Technology, Vol. I: BS Raghuwanshi
3. Karyashala Takniki: JK Kapoor

TH.4. ENGINEERING SCIENCE

Theory	3 Periods per week	Examination	2hours
Total Periods	45 Periods	Total Marks	50 Marks

Topic Wise Distribution of Periods

Sl. No.	Topic	Periods
1	Soldering and Brazing	10
2	Measuring Instruments	7
3	Electrical Engineering Drawing	10
4	Electrical wiring	10
5	Earthing	8

DETAILED CONTENTS

1.0 Soldering and Brazing:

- General characteristics of soldering, brazing joints, processes and their characteristics, brief description of soldering and brazing tools equipment, types of solders and fluxes and their uses, soldering defects and their remedies, brazing materials, advantages and disadvantages of soldering and brazing. Introduction to PCB, PCB designing, wet etching, dry etching, track correction, wiring, single sided and double sided PCB.

2.0 Measuring Instruments:

- Construction and working principles of moving iron and moving coil voltmeters and ammeters, dynamometer type wattmeter, ohm meter, megger and induction type energy meter- their circuit connection and application for measurement of electrical quantities.

3.0 Electrical Engineering Drawing:

- Schematic and wiring diagram for domestic simple wiring, symbols used for different electrical devices and equipments.

4.0 Electrical wiring:

- Types of wiring – cleat wiring, casing and capping, C.T.S./T.R.S. wiring, metal sheath wiring, conduit wiring and concealed wiring – their procedure. Factors of selection of a particular wiring system, importance of switch, fuse

5.0 Earthing:

- Earthing of wiring system, types of faults, their causes and remedies, Types of earthing- plate earthing and Pipe earthing, their procedure and application. Methods of finding numbers of circuits and circuit distribution by distribution board system loop in system of wiring connections IE rules related to wiring.

Syllabus to be covered before IA: Chapter 1,2,3

RECOMMENDED BOOKS

1. Environmental Studies, M.P. Poonia & S.C. Sharma, Khanna Publishing House
2. A Textbook of Environmental Sciences, Rimpi Mehani Ne' Chopra, Khanna Publishing House

Pr 1. MECHANICAL WORKSHOP PRACTICE- I

Practical	1.5 Periods per week	Examination	3 hours
Total Periods	23 Periods	Total Marks	50 Marks

List of Practicals

1. CARPENTRY SHOP WORK:

(EX-1) Planning and sawing practice

(EX-2) Making of lap joint

(EX-3) Making of mortise and tanon joint

2. PAINTING AND POLISHING:

(EX-1) To prepare a wooden surface for painting apply primer on one side and to paint the same side.
To prepare French polish for wooden surface and Polish the other side.

(EX-2) To prepare metal surface for painting, apply primer and paint the same.

(EX-3) To prepare a metal surface for spray painting, first spray primer and paint the same by spray painting gun and compressor system.

The sequence of polishing will be as below- (i) Abrasive cutting by leather wheel. (ii) Polishing with hard cotton wheel and with polishing material. (iii) Buffing with cotton wheel or buff wheel.

3. SHEET METAL WORKING AND SOLDERING:

(EX-1) Cutting, shearing and bending of sheet.

(EX-2) To prepare a soap case by the metal sheet

(EX-3) To make a funnel with thin sheet and to solder the seam of the same

(EX-4) To make a cylinder and to solder the same

4. FITTING SHOP WORK:

(EX-1) Hack sawing and chipping of M.S. flat

(EX-2) Filing and squaring of chipped M.S. job

(EX-3) Filing on square of rectangular M.S. Plate

5. PLUMBING SHOP WORK:

(EX-1) Cutting and threading practice for using socket, elbow and tee etc and to fit it on wooden practice board.

6. SMITHY SHOP WORK:

(EX-1) To prepare square angular piece by M.S. rod

(EX-2) To Braze M.S. flat/Tipped tool on M.S. shank

(EX-3) To make a screw driver with metallic handle

7. WELDING SHOP WORK:

(EX-1) Welding practice gas & electric

(EX-2) Welding for lap joint after preparing the edge

(EX-3) Welding Butt joint after preparing the edge

Reference Books:

1. Workshop Technology, Vol. I: Hazra & Chaudhry

Pr 2. IT TOOLS LAB

Practical	1.5 Periods per week	Examination	3 hours
Total Periods	23 Periods	Total Marks	50 Marks

List of Practicals

1. Spreadsheets, Word, Presentation
2. Multimedia Design
3. Troubleshooting
4. Project / Practical File
5. Viva Voce