

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE: ASSISTANT PLUMBER-GENERAL

(QUALIFICATION PACK: Ref. Id. PSC/Q0102)

SECTOR: PLUMBING
Grades 09 and 10



विद्यया ऽ भूतमश्नुते



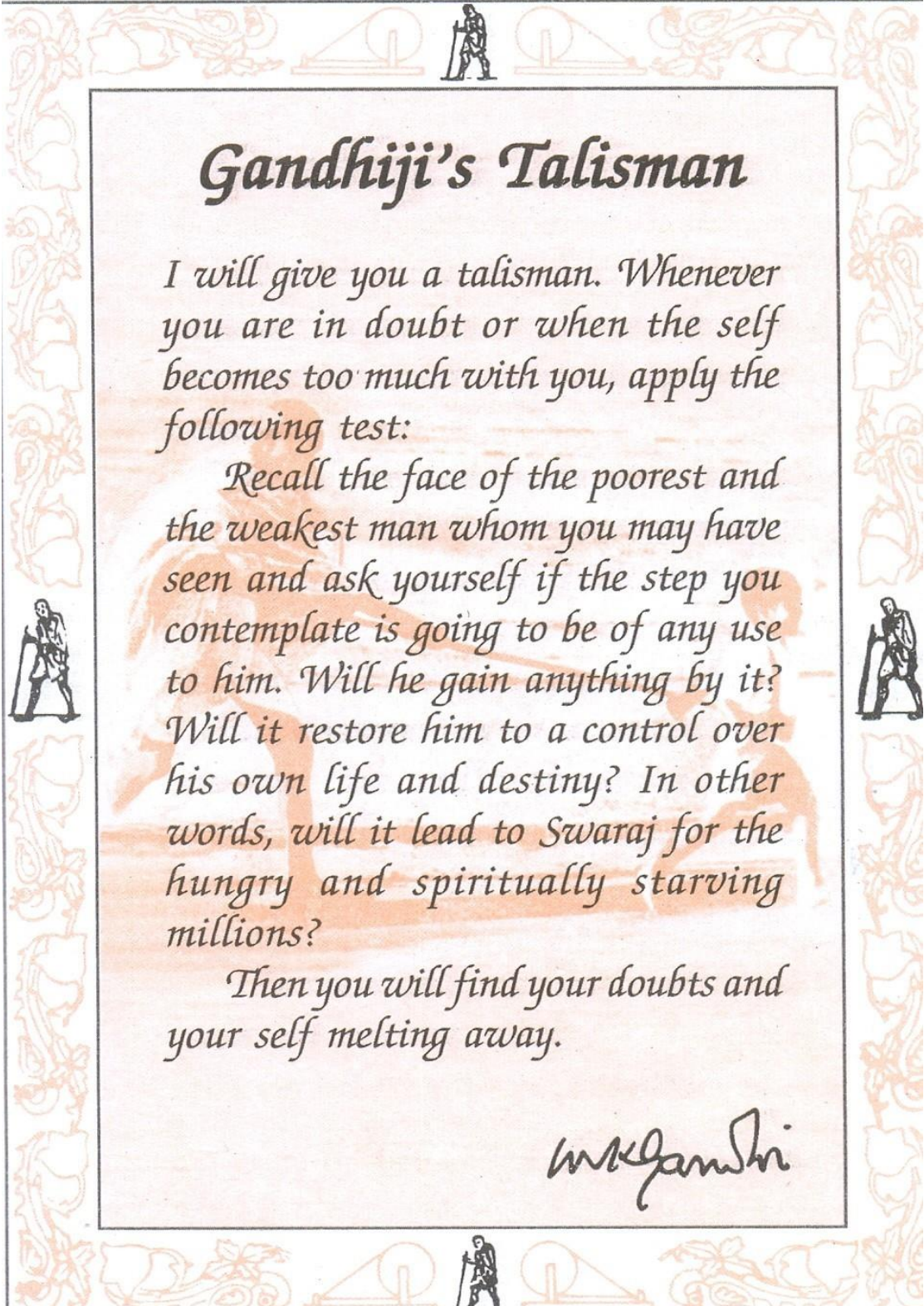
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NCERT

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under Ministry of Education, Government of India)

Shyamla Hills, Bhopal-462002, M.P., India

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Gandhiji's Talisman

I will give you a talisman. Whenever you are in doubt or when the self becomes too much with you, apply the following test:

Recall the face of the poorest and the weakest man whom you may have seen and ask yourself if the step you contemplate is going to be of any use to him. Will he gain anything by it? Will it restore him to a control over his own life and destiny? In other words, will it lead to Swaraj for the hungry and spiritually starving millions?

Then you will find your doubts and your self melting away.

M.K. Gandhi

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एन सी ई आर टी
NCVET

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**LEARNING OUTCOME BASED
VOCATIONAL CURRICULUM**

**Assistant Plumber–General,
January, 2023**

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Joint Director
PSS Central Institute of Vocational Education,
NCERT, Shyamla Hills, Bhopal



PATRONS

Prof. Dinesh Prasad Saklani, Ph.D.,
Director,
National Council of Educational Research
and Training (NCERT),
New Delhi

Dr. Deepak Paliwal, Ph.D.,
Joint Director
PSS Central Institute of Vocational Education,
Bhopal

COURSE COORDINATOR

Prof. Saurabh Prakash
Professor and Head
Engineering and Technology Department,
PSS Central Institute of Vocational Education
Bhopal

FOREWARD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), a constituent of the National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome-based curricula and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. The curriculum has been developed for the vocational education programme introduced under the Centrally Sponsored Scheme of *Samagra Shiksha* of the *Ministry of Education (erstwhile, Ministry of Human Resource Development)* and is aligned to the National Skill Qualifications Framework (NSQF). The curricula for vocational courses are being developed under the project approved by the Project Approval Board (PAB) of '*Samagra Shiksha*', which is an overarching programme for the school education sector extending from pre-school to Grade 12.

It is a matter of great pleasure to introduce this learning outcome-based curriculum as part of the vocational training packages for the job role of Assistant Plumber-General. The curriculum has been developed for the secondary students of grades 09 and 10 and is aligned to the National Occupation Standards (NOSs) for the job role. The curriculum aims to provide children with employability and vocational skills to support occupational mobility and lifelong learning. It will help them to acquire specific occupational skills that meet employers' immediate skill needs. The teaching-learning is to be done through interactive sessions in classrooms, practical activities in laboratories or workshops, projects, field visits, etc. and professional experience is to be provided through on-the-job training.

The curriculum has been developed and reviewed by a group of experts and their contributions are duly acknowledged. The utility of the curriculum will be adjudged by the qualitative improvement that it brings about in teaching-learning. The feedback and suggestions on the content by the teachers and other stakeholders will be of immense value to us in bringing about further improvement in this document.

Dinesh Prasad Saklani
Director
National Council of Education Research and Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth is immense and the possibilities are equally exciting. The world is looking at us to deliver sustainable growth and progress. To meet the growing expectations, India will largely depend upon its young workforce. In order to fulfil the growing aspirations of our youth and the demand for a skilled human resource, the Ministry of Education (erstwhile, Ministry of Human Resource Development (MHRD), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of School Education that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted with the responsibility to develop learning outcome- based curricula, student textbooks and e-learning material for job roles in various sectors.

The PSSCIVE firmly believes that the vocationalisation of education in the nation needs to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfil the needs of society and the world of work. In order to honour its commitment to the nation, the PSSCIVE is developing learning outcome-based curricula with the involvement of faculty members and leading experts in the field. It is being done through the concerted efforts of leading academicians, professionals, policymakers, partner institutions, Vocational Education and Training (VET) experts, industry representatives, and teachers. The expert group, through a series of consultations, working group meetings and use of reference materials develops a National curriculum. We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum.

The success of this curriculum depends upon its effective implementation, and it is expected that the managers of vocational education programme, vocational educators, vocational teachers/trainers, and other stakeholders will make earnest efforts to provide better facilities, develop linkages with the industry or world of work and foster a conducive learning environment for the students for effectively transacting the curriculum and to achieve the learning outcomes as per the content of the curriculum document.

DEEPAK PALIWAL

Joint Director

PSS Central Institute of Vocational Education

ACKNOWLEDGEMENTS

On behalf of the team at the PSS Central Institute of Vocational Education (PSSCIVE) we are grateful to the members of the Project Approval Board (PAB) of *Samagra Shiksha* and the officials of the Ministry of Education (MoE), Government of India for the financial support to the project for development of learning outcome-based curricula.

We are grateful to the Director, National Council of Educational Research and Training (NCERT) for his support and guidance. We also acknowledge the contributions of our colleagues at the NCERT, National Council for Vocational Education and Training (NCVET), National Skill Development Corporation (NSDC), Water Management and Plumbing Skill Council (WMPSC) and Sector Skill Council for Management and Entrepreneurship and Professional Skills for their academic support and cooperation in the development of Qualification file and curriculum.

We are grateful to Prof. Saurabh Prakash, Course Coordinator for his untiring efforts and contribution to the development of this learning outcome-based curriculum. The contribution made by Er. Hemant Wadikar, Dr. Abhay Kumar Jha, Ms. Pooja Sharma, Ms. Gunjan Aneja, Dr. Manoj Arya and his team, Industry Partner in the development of the curriculum for domain and non-domain skills is duly acknowledged.

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1. COURSE OVERVIEW

COURSE TITLE: Assistant Plumber - General

Assistant Plumber-General is an important job role in installation and repair of plumbing fittings and fixtures. Assistant Plumber-General is responsible for assists the plumber in installation and repair of plumbing fittings and fixtures. The job role holder organises and hands over tools, clears work area, cuts and bends pipes as per the specified dimensions. The individual also supports the plumber with other tasks as per instructions received. The person should be able to work independently on the assignment. The person should be comfortable in performing laborious work, should be a good listener, good at taking and following instructions, a good team player and result oriented with positive attitude.

COURSE OUTCOMES: On completion of the course, students should be able to:

- Communicate effectively with the customers;
- Identify the principal components of a computer system
- Identify and control hazards in the workplace that pose a danger or threat to their safety or health, or that of others.
- Demonstrate self-management skills.
- Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities.
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection.
- Identify and demonstrate safe use of hand and power tools/equipment used in plumbing;
- Gain insight into Assistant Plumber-General job role and its career progression
- Do installation of basic sanitary fixtures in housing, commercial and institutional setups
- Do repairing of basic plumbing systems, repair of pipes and sanitary fixtures in housing, commercial and institutional setups
- Maintenance and servicing of plumbing systems in housing, commercial and institutional setups
- Coordinating with the senior and other working team about communicating with colleagues and seniors in order to achieve smooth and hazard free work flow.
- Maintaining a healthy, safe and secure working environment. Work effectively in a team to deliver results at a Plumbing site

COURSE REQUIREMENTS: The learner should have the basic knowledge of science.

COURSE LEVEL: On completion of this course, a student can take up a course in the area of Plumbing sector.

COURSE DURATION:	400 hrs
	Grade 9: 200 hrs
	Grade 10: 200 hrs

Total	: 400 hrs

2. SCHEME OF UNITS

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Grades 9 and 10 opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Grade 9 is as follows:

GRADE 9			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1 : Communication Skills- I	20	10
	Unit 2 : Self-management Skills- I	10	
	Unit 3 : Information and Communication Technology Skills- I	20	
	Unit 4 : Entrepreneurial Skills- I	15	
	Unit 5 : Green Skills- I	10	
	Total	75	10
Part B	Vocational Skills		
	Unit 1: Introduction to plumbing	15	30
	Unit 2: Tools for plumbing	25	
	Unit 3: Plumbing material and pipes, types and grades of pipe	20	
	Unit 4: Measurements and symbols used in plumbing	15	
	Unit 5 : Plumbing fittings, Joints and valves	20	
	Total	95	30
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	05	20
	Total	200	100

The unit-wise distribution of hours and marks for Grade 10 is as follows:

GRADE 10			
	Units	No. of Hours for Theory and Practical 200	Max. Marks for Theory and Practical 100
Part A	Employability Skills		
	Unit 1 : Communication Skills– II	20	10
	Unit 2 : Self-management Skills– II	10	
	Unit 3 : Information and Communication Technology Skills– II	20	
	Unit 4 : Entrepreneurial Skills– II	15	
	Unit 5 : Green Skills– II	10	
	Total	75	
Part B	Vocational Skills		
	Unit 1: Basic building construction	15	30
	Unit 2: PIPES –Cutting, Threading, Joining and Testing of Pipelines	30	
	Unit 3: Plumbing and sanitary fixtures	20	
	Unit 4: Maintaining a healthy, safe and secure work environment	15	
	Unit 5: Optimum utilization of resources	15	
	Total	95	30
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	05	10
	Grand Total	200	100

3. TEACHING/TRAINING ACTIVITIES

The teaching and training activities have to be conducted in classroom, laboratory/ workshops and field visits. Students should be taken to field visits for interaction with experts and to expose them to the various tools, equipment, materials, procedures and operations in the workplace. Special emphasis should be laid on the occupational safety, health and hygiene during the training and field visits.

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional or teaching aids, such as audio-video materials, colour slides, charts, diagrams, models, exhibits, hand-outs, online teaching materials, etc. to transmit knowledge and impart training to the students.

PRACTICAL WORK IN LABORATORY/WORKSHOP

Practical work may include but not limited to hands-on-training, simulated training, role play, case based studies, exercises, etc. Equipment and supplies should be provided to enhance hands-on learning experience of students. Only trained personnel should teach specialized techniques. A training plan that reflects tools, equipment, materials, skills and activities to be performed by the students should be submitted by the vocational teacher to the Head of the Institution.

FIELD VISITS/ EDUCATIONAL TOUR

In field visits, children will go outside the classroom to obtain specific information from experts or to make observations of the activities. A checklist of observations to be made by the students during the field visits should be developed by the Vocational Teachers for systematic collection of information by the students on the various aspects. Principals and Teachers should identify the different opportunities for field visits within a short distance from the school and make necessary arrangements for the visits. At least three field visits should be conducted in a year.

4. ASSESSMENT AND CERTIFICATION

Upon successful completion of the course by the candidate, the Central/State Examination Board for Secondary Education and the respective Sector Skill Council will certify the competencies.

The National Skills Qualifications Framework (NSQF) is based on outcomes referenced to the National Occupation Standards (NOSs), rather than inputs. The NSQF level descriptors, which are the learning outcomes for each level, include the process, professional knowledge, professional skills, core skills and responsibility. The assessment is to be undertaken to verify that individuals have the knowledge and skills needed to perform a particular job and that the learning programme undertaken has delivered education at a given standard. It should be closely linked to certification so that the individual and the employer could come to know the competencies acquired through the vocational subject or course. The assessment should be reliable, valid, flexible, convenient, cost effective and above all it should be fair and transparent. Standardized assessment tools should be used for assessment of knowledge of students. Necessary arrangements should be made for using technology in assessment of students.

KNOWLEDGE ASSESSMENT (THEORY)

Knowledge Assessment should include two components: one comprising of internal assessment and second an external examination, including theory examination to be conducted by the Board. The assessment tools shall contain components for testing the knowledge and application of knowledge. The knowledge test can be objective paper based test or short structured questions based on the content of the curriculum.

WRITTEN TEST

It allows candidates to demonstrate that they have the knowledge and understanding of a given topic. Theory question paper for the vocational subject should be prepared by the subject experts comprising group of experts of academicians, experts from existing vocational subject experts/teachers, and subject experts from university/colleges or industry. The respective Sector Skill Council should be consulted by the Central/State Board for preparing the panel of experts for question paper setting and conducting the examinations.

The blue print for the question paper may be as follows:

Duration: 3 hrs

Max. Mark: 30

S. No.	Typology of Question	No. of Questions			Marks
		Very Short Answer (1 mark)	Short Answer (2 Marks)	Long Answer (3 Marks)	
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	2	1	2	10
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	1	2	2	11
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, provide an example, or solve a problem)	0	1	1	05
4.	High Order Thinking Skills – (Analysis & Synthesis – Classify, compare, contrast, or differentiate between different pieces of information; Organize and/ or integrate unique pieces of information from a variety of sources)	0	1	0	02
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	0	1	0	02
	Total	3x1=3	6x2=12	5x3=15	30 (14 questions)

SKILL ASSESSMENT (PRACTICAL)

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, using a competency checklist. The competency checklist should be developed as per the National Occupation Standards (NOSs) given in the Qualification Pack for the Job Role to bring about necessary consistency in the quality of assessment across different sectors and Institutions. The student has to demonstrate competency against the performance criteria defined in the National Occupation Standards and the assessment will indicate that they are 'competent', or are 'not yet competent'. The assessors assessing the skills of the students should possess a current experience in the industry and should have undergone an effective training in assessment principles and practices. The Sector Skill Councils should ensure that the assessors are provided with the training on the assessment of competencies.

Practical examination allows candidates to demonstrate that they have the knowledge and understanding of performing a task. This will include hands-on practical exam and viva voce. For practical, there should be a team of two evaluators – the subject teacher and the expert from the relevant industry certified by the Board or concerned Sector Skill Council. The same team of examiners will conduct the viva voce.

Project Work (individual or group project) is a great way to assess the practical skills on a certain time period or timeline. Project work should be given on the basis of the capability of the individual to perform the tasks or activities involved in the project. Projects should be discussed in the class and the teacher should periodically monitor the progress of the project and provide feedback for improvement and innovation. Field visits should be organised as part of the project work. Field visits can be followed by a small-group work/project work. When the class returns from the field visit, each group might be asked to use the information that they have gathered to prepare presentations or reports of their observations. Project work should be assessed on the basis of practical file or student portfolio.

Student Portfolio is a compilation of documents that supports the candidate's claim of competence. Documents may include reports, articles, photos of products prepared by students in relation to the unit of competency.

Viva voce allows candidates to demonstrate communication skills and content knowledge. Audio or video recording can be done at the time of viva voce. The number of external examiners would be decided as per the existing norms of the Board and these norms should be suitably adopted/adapted as per the specific requirements of the vocational subject. Viva voce should also be conducted to obtain feedback on the student's experiences and learning during the project work/field visits.

CONTINUOUS AND COMPREHENSIVE EVALUATION

Continuous and Comprehensive Evaluation (CCE) refers to a system of school-based evaluation of students that covers all aspects of student's development. In this scheme, the term 'continuous' is meant to emphasize that evaluation of identified aspects of students 'growth and development' is a continuous process rather than an event, built into the total teaching-learning process and spread over the entire span of academic session. The second term 'comprehensive' means that the scheme attempts to cover both the scholastic and the co-scholastic aspects of students' growth and development. For details, the CCE manual of Central Board of Secondary Education (CBSE) or the guidelines issued by the State Boards on the procedure for CCE should be followed by the Institutions.

5. UNIT CONTENTS

GRADE 9

PART A: EMPLOYABILITY SKILLS

S.No.	Units	Duration (Hrs)
1.	Unit 1: Communication Skills - I	20
2.	Unit 2: Self-management Skills - I	10
3.	Unit 3: Information and Communication Technology Skills-I	20
4.	Unit 4: Entrepreneurial Skills - I	15
5.	Unit 5: Green Skills - I	10
	Total	75

Unit 1: Communication Skills - I

Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 Hrs)
<p>1. Demonstrate the knowledge of importance, elements and perspectives in communication</p>	<p>1. Introduction to communication process 2. Importance of communication 3. Elements of communication 4. Perspectives in communication 5. Effective communication</p>	<p>1. Role play on the communication process 2. Group discussion on the importance of communication and factors affecting perspectives in communication 3. Charts preparation on elements of communication 4. Asking students to write statements exemplify the use of the 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete) for effective communication</p>	<p>02</p>
<p>2. Demonstrate the knowledge of verbal communication</p>	<p>1. Verbal communication 2. Types of verbal communication 3. Advantages and disadvantages of verbal communication 4. Public speaking</p>	<p>1. Role play of a phone conversation 2. Chart preparation on types of verbal communication 3. Group discussion on advantages and disadvantages of verbal communication 4. Delivering a speech and practicing public speaking by using 3P's</p>	<p>02</p>

<p>3. Demonstrate the knowledge of non-verbal communication</p>	<p>1. Non-verbal communication 2. Importance of non-verbal communication 3. Types of non verbal communication 4. Visual communication</p>	<p>1. Role play on non-verbal communication 2. Group discussion and demonstration of Do's and Don'ts to avoid body language mistakes 3. Group discussion on three methods of communication</p>	<p>02</p>
<p>4. Demonstrate the knowledge of basic writing skills</p>	<p>1. Writing skills: Parts of speech 2. Using capitals 3. Punctuation 4. Basic parts of speech</p>	<p>1. Reading paragraphs and sentences and identifying parts of speech 2. Constructing and writing sentences by using parts of speech 3. Identifying nouns by guessing the name, place, animal, and thing</p>	<p>02</p>
<p>5. Describe the parts and types of sentences</p>	<p>1. Writing skills: Sentences 2. Parts of a sentence 3. Types of objects 4. Types of sentences – Active and Passive 5. Types of sentences, according to their purpose 6. Paragraphs</p>	<p>1. Framing and writing sentences using direct and indirect objects 2. Writing a paragraph using active and passive voice 3. Writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative)</p>	<p>02</p>
<p>6. Demonstrate the knowledge of pronunciation basics</p>	<p>1. Pronunciation Basics 2. Speaking correctly 3. Phonetics 4. Types of sounds</p>	<p>1. Pronouncing words and identifying vowels, diphthongs and consonants 2. Practicing the pronunciation of words</p>	<p>02</p>
<p>7. Demonstrate how to greet and introduce self</p>	<p>1. Greetings and Introductions 2. Greetings 3. Types of greetings 4. Introducing yourself and others</p>	<p>1. Role-play on Formal and informal greetings 2. Role-play on introducing someone 3. Practice and discussion on how to greet different people.</p>	<p>02</p>

8. Answer questions that others ask about you	<ol style="list-style-type: none"> Talking about self Filling a form 	<ol style="list-style-type: none"> Practicing introducing yourself and Practicing filling of forms Role-play on Self Introduction 	02
9. Asking questions according to a situation	<ol style="list-style-type: none"> Asking questions Need for asking questions Method for asking questions 	<ol style="list-style-type: none"> Framing and writing questions (using Who, Where, When, What, Why and How) Framing and writing questions (based on purpose of the question) Discussing and guessing the personality using framed questions 	02
10. Use the correct question words to ask open-ended and close-ended questions	<ol style="list-style-type: none"> Asking questions Types of questions Framing questions 	<ol style="list-style-type: none"> Framing and writing open-ended and close-ended questions. Group practice on framing question Identifying open-ended and closed-ended questions. 	02
Total			20

Unit 2: Self-management Skills – I

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Duration (10 Hrs)
1. Describe the meaning and importance of self-management	<ol style="list-style-type: none"> Introduction to self-management and its components Self-awareness Self-confidence Self-motivation Positive thinking Self-control Problem solving Personal hygiene and grooming Team work Time management Goal setting 	<ol style="list-style-type: none"> Group discussion on self-management skills Performing activities to know how much aware are you about yourself. Chart preparation on components of self-management 	01

<p>2. Identifying strength and weakness analysis</p>	<p>1. Identifying strength and weakness 2. Knowing yourself 3. Strength and Weakness analysis 4. Difference between interests and abilities</p>	<p>1. Group discussion on aim and goal in life 2. Perform a strength and weakness analysis 3. Group discussion on interests and abilities</p>	<p>01</p>
<p>3. Build self-confidence</p>	<p>1. Self-confidence 2. Qualities of self-confident people 3. Building self-confidence</p>	<p>1. Role play on building self-confidence 2. Performing activities on building confidence through positive words</p>	<p>02</p>
<p>4. Building the concept on positive thinking</p>	<p>1. Positive thinking 2. Positive thinking and its importance 3. How to keep your thinking positive?</p>	<p>1. Story-telling 2. Role-play on following the class rules 3. Practicing saying positive words 4. Making a list of steps involved in self-reflection) on how you will follow positive attitude practices 5. Home activity on helping others, community service and social work</p>	<p>02</p>
<p>5. Describe the concept and aspects of personal hygiene</p>	<p>1. Personal hygiene 2. Three steps of personal hygiene • Care • Wash • Avoid 3. Essential steps of handwashing</p>	<p>1. Role-play on following personal hygiene steps 2. Discussion and follow up on personal hygiene practices</p>	<p>02</p>
<p>6. Follow the guidelines for dressing and personal grooming</p>	<p>1. Grooming 2. Grooming and its importance 3. Guidelines for dressing and grooming –</p>	<p>1. Role play on dressing and grooming standards 2. Self-reflection on dressing and</p>	<p>02</p>

	clothes, hair, face	grooming well	
Total			10

Unit 3: Information and Communication Technology Skills – I

Learning Outcome	Theory (06 hrs)	Practical (14 hrs)	Duration (20 Hrs)
1. Explain the role of Information and Communication Technology (ICT) in day-to-day life and the workplace	1. Introduction to Information and Communication Technology (ICT) 2. ICT at workplace 3. ICT at home	1. Group discussion on past, present, and future use of ICT 2. Preparations of posters on applications of ICT	02
2. Differentiate between the ICT tools and use of mobile apps	1. ICT tools smartphones and tablets I 2. Smartphones 3. Tablets 4. TV and Radio 5. Application or apps	1. Performing activities to get familiar with mobile devices	02
3. Differentiate between smartphones and tablets	1. ICT tools -smartphone and tablets II 2. Mobile device layout 3. Basic features of a mobile device 4. Home screen of mobile device 5. Basic gestures used	1. Performing activities to get familiar with the mobile device – use and applications of mobile devices	02
4. Describe the parts of computer and the computer peripherals	1. Parts of a computer and peripherals 2. Parts of a computer 3. Input devices 4. Output devices 5. Peripherals devices and their functions 6. Central Processing Unit (CPU) 7. Understanding Random Access Memory (RAM) and Read Only Memory (ROM) 8. Motherboard 9. Ports and connections	1. Chart preparation on components of a computer 2. Group activity on connecting devices to a computer	02
5. Demonstrate basic computer	1. Basic computer operations 2. Computer hardware	1. Group activity on use of computer 2. Group practice	02

operations	<p>and software</p> <ol style="list-style-type: none"> 3. Starting a computer 4. Log in and log out 5. Shutting down computer 6. Using the keyboard 7. Using a mouse 	<p>on using the keyboard</p>	
6. Perform basic file computer operations	<ol style="list-style-type: none"> 1. Performing Basic file operations 2. Need to perform basic file operations. 3. Files and folders - creating a file and using text editor Ubuntu 	<ol style="list-style-type: none"> 1. Group practice on creating a file. 	02
7. Demonstrate the knowledge of internet and networking	<ol style="list-style-type: none"> 1. Communication and Networking -Basics of Internet 2. Use of the Internet 3. Connecting to the Internet <ul style="list-style-type: none"> • Types of connection • Bandwidth • Internet browser 	<ol style="list-style-type: none"> 1. Group discussion on the uses of the internet 	02
8. Perform internet browsing	<ol style="list-style-type: none"> 1. Communication and Networking – Internet Browsing 2. World Wide Web 3. Web page 4. Web browsers 	<ol style="list-style-type: none"> 1. Group practice on web browsing 	02
9. Apply the knowledge of communication networking	<ol style="list-style-type: none"> 1. Communication and Networking – Introductions to E-Mail 2. How does the E-mail work? 3. Email Id or address 4. Advantages of E-mail 	<ol style="list-style-type: none"> 1. Group discussion on using E-mail and its advantages 	01
10. Create an Email account	<ol style="list-style-type: none"> 1. Communication and Networking – Creating an E-mail account 2. Creating an E-mail account 3. Steps to open an E-mail account on Gmail 	<ol style="list-style-type: none"> 1. Group practice on creating and operating an e-mail account 	01

11. Write an Email	<ol style="list-style-type: none"> 1. Communication and Networking – Writing an E-mail 2. Writing an E-mail 3. Attaching a file to an E-mail 4. Managing folders 	1. Group practice on writing an e-mail with attachments	01
12. Reply an Email	<ol style="list-style-type: none"> 1. Communication and Networking – Receiving and Replying to an E-mail 2. Receiving Email 3. Replying to an Email 4. Forwarding Email 5. Deleting Email 	1. Group practice on receiving and replying to an e-mail.	01
Total			20

Unit 4: Entrepreneurial Skills - I

Learning Outcome	Theory (06 hrs)	Practical (09 hrs)	Duration (15 Hrs)
1. Describe the concept of Entrepreneurship skills	<ol style="list-style-type: none"> 1. What is Entrepreneurship? 2. Entrepreneurship 3. Enterprise 	1. Group activity on guessing the Entrepreneur	04
2. Describe the role of entrepreneurship	<ol style="list-style-type: none"> 1. Role of Entrepreneurship 2. Economic development 3. Social development 4. Improved standard of living 5. Optimal use of resources 6. More benefits at lower prices - products and services at competitive prices 	<ol style="list-style-type: none"> 1. Group discussion on "A world without Entrepreneurs" 2. Role-play on roles of entrepreneurship 	03
3. Describe the qualities of a successful entrepreneur	<ol style="list-style-type: none"> 1. Qualities of a successful entrepreneur 2. Patience 3. Positivity 4. Hardworking 5. Confidence 6. Open to trial and error 7. Creativity and innovation 	<ol style="list-style-type: none"> 1. Role-play on appearing for an interview 2. Group activity on interactions with entrepreneurs 	02

<p>4. State the characteristics of entrepreneurship</p>	<p>1. Distinguishing characteristics of entrepreneurship and wage employment 2. Characteristics of entrepreneurship 3. Wage employment 4. Benefits of entrepreneurship</p>	<p>1. Group activity on identifying characteristics of enterprise 2. Discussion on advantages of entrepreneurship over wage employment</p>	<p>03</p>
<p>5. Identify the type of business activity</p>	<p>1. Types of business activities 2. Product business 3. Service business 4. Hybrid business</p>	<p>1. Group activity on identifying different types of products and services</p>	<p>01</p>
<p>6. Differentiate between the product, service, and hybrid businesses</p>	<p>1. Product, Service, and Hybrid Businesses 2. Types of product-based business 3. Manufacturing businesses 4. Trade businesses</p>	<p>1. Poster making on business activities around us</p>	<p>01</p>
<p>7. Describe the entrepreneurship development process</p>	<p>1. Entrepreneurship 2. Development Process 3. Steps of starting a business</p> <ul style="list-style-type: none"> • Idea generation • Getting money and material • Understanding customer needs • Improving product/ service 	<p>1. Group activity on Make-and-Sell business</p>	<p>01</p>
<p>Total</p>			<p>15</p>

Unit 5: Green Skills - I

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Duration (10 Hrs)
1. Demonstrate the knowledge of society and environment	1. Society and Environment 2. Natural resources 3. Renewable and Non-renewable resources 4. Types of pollutions 5. Climate change 6. Harmful radiation 7. Natural disaster 8. Saving the environment: What can you do? 9. Reduce, reuse and recycle 10. Actions for saving the environment	1. Group activity on listing the factors influencing the environment 2. Group activity on listing the steps one can take to save the environment	05
2. Describe the meaning and importance of conserving natural resources	1. Conserving natural resources 2. Soil conservation 3. Water conservation 4. Energy conservation 5. Food conservation 6. Forest conservation	1. Group discussion on various ways of conserving natural resources	02
3. Describe the meaning and scope of sustainable development and green economy	1. Sustainable Development and Green Economy 2. Sustainable Development 3. Sustainable Development 4. Goals (SDGs) 5. Green growth 6. Green economy 7. Components of green economy 8. Skill development for the green economy 9. Green skills 10. Green jobs 11. Green projects	1. Group discussion on importance of green skills 2. Poster making on importance of green economy	03
Total			10

PART B: VOCATIONAL SKILLS

S. No.	Units	Duration (Hrs.)
1	Unit 1: Introduction to plumbing	15
2	Unit 2: Tools for plumbing	25
3	Unit 3: Plumbing material and pipes, types and grades of pipe	20
4	Unit 4: Measurements and symbols used in plumbing	15
5	Unit 5: Plumbing fittings, Joints and valves	20
	Total	95

Unit 1: Introduction to Plumbing

Learning Outcome	Theory (06 Hrs)	Practical (09 Hrs)	Duration (15 Hrs)
1. Overview of plumbing industry, scope of employment in this sector	1. Importance of plumbing 2. Job opportunities in plumbing	1. List the jobs related to water and plumbing sector	05
2. Responsibilities of an assistant plumber general	1. Responsibilities of assistant plumber general	1. List the responsibilities of assistant plumber general	05
3. Identifying the plumbing components	1. Meaning of plumbing 2. Sketches 3. Application and Uses	1. Visit to school building and see plumbing items 2. List the plumbing items in a school building	05
Total			15

Unit 2: Tools for Plumbing

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Identify the tools to be used	1. Importance of tools 2. Different types of tools used in plumbing Knowledge of tools such as Bench vice, Pipe, vice, Wrenches, Adjustable wrench, Water-pump, plies, Spanners, Ring spanner,	1. Identify the tools 2. Draw the figure of tools 3. Do the market survey to find out the manufacturer and cost of each tools	10

	Open ended spanner, Combination Spanners, Bi-hexagonal, ring spanner, Chisel, Hammer, Chain wrench Rover jumper, Trowel, Screw driver, Hacksaw, Pipe cutter, Pipe bending, machine Threading dies, File, Pliers, Caulking tools, Drill machine, Drill bit Hangers, Measuring tape, Plumb rule and bob Sprit level, Pipe threader		
2. Handling of tools	<ol style="list-style-type: none"> 1. Methods of holding the tools 2. Safety precautions to be taken while using the tools 3. Maintaining the plumbing tools and equipment's 	<ol style="list-style-type: none"> 1. Do practice of handling of tools using safety measures 2. Demonstrate the procedure of cleaning and maintaining, plumbing resources and tools 	10
3. Maintenance of tools	<ol style="list-style-type: none"> 1. Impact of factors such as temperature, pH (acidity levels), chemical composition, oxidation and ageing on plumbing tools, equipment, products and materials 2. Processes of prevention and their application used in the plumbing industry 	<ol style="list-style-type: none"> 1. Measuring the temperature of water 2. Reading the chemical composition of water 3. List the processes of prevention 	05
Total			25

Unit 3: Plumbing materials and pipes, types and grades of pipe

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Basic task to facilitate plumbing work	<ol style="list-style-type: none"> 1. Importance of obtaining clarity about the task to be performed and following instruction and standard procedure. 2. Unpacking and checking of material as per manufacturer guideline 	<ol style="list-style-type: none"> 1. Demonstrate the process of unpacking of plumbing pipes, fittings fixtures and related materials. 	10
2. Identify the plumbing materials used	<ol style="list-style-type: none"> 1. Plumbing material and its importance 2. Method/technique of application of plumbing material Precautions to be used during application. 3. Various tools used for application of material 	<ol style="list-style-type: none"> 1. Enlist and identify the plumbing materials 2. Technique of application of the material 3. Demonstrate the application process 	05
3. Identify the plumbing pipes	<ol style="list-style-type: none"> 1. Importance and use of plumbing pipes 2. Types and quality of pipes. 3. Grades and characteristics of pipes 4. Cost of the pipes Precaution while handling the pipes 	<ol style="list-style-type: none"> 1. Survey the institute building and identify the plumbing pipes used 2. Market survey and make a list of plumbing pipes available. 3. Visit a construction site and see plumbing pipes with their uses at site 	05
Total			20

Unit 4: Measurements and Symbol used in Plumbing

Learning Outcome	Theory (06 Hrs)	Practical (11 Hrs)	Duration (15 Hrs)
1. Identify the measurement systems used for plumbing	<ol style="list-style-type: none"> 1. Importance of measurement 2. Types of measurement 3. Measurement tools 4. Conversion method 	<ol style="list-style-type: none"> 1. Convert different units in MKS to FPS system 2. Read and note down the values in measuring tools 3. Measure the dimensions and record the value of different plumbing materials 	05
2. Measure the various quantity to be used in plumbing	<ol style="list-style-type: none"> 1. Technique of measurement with tools 2. Important units of measurement 	<ol style="list-style-type: none"> 1. Measure the length 2. Measure the density 3. Measure the Pressure 4. Calculate the quantity of material as per data above recorded 	05
3. Identify the various symbols used for plumbing work	<ol style="list-style-type: none"> 1. Importance of symbols 2. Symbols used in plumbing 3. List the types of symbols 	<ol style="list-style-type: none"> 1. List the symbols for various plumbing items 2. Draw the symbols in drawing sheet 3. Identify the symbol details from drawing and note what it signifies or indicates 	05
Total			15

Unit 5: Plumbing fittings, joints and valves

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Able to identify plumbing fittings	2. Importance and use of plumbing fittings 3. Types and properties of plumbing fittings. 4. Tools required for fixing the plumbing fittings 5. Procedure of fixing the fittings like Elbow, Gasket, Couplings, Union, Reducer, Tee, Nipple, Valve and Trap etc.	1. Identify the different types of plumbing fittings 2. Drawings /sketches of plumbing fittings 3. Reading and interpreting the sketches/basic working drawing 4. Market survey and identify the different type of plumbing fittings 5. Practice of fixing of plumbing fittings	10
2. Able to identify plumbing joints	1. Importance and use of plumbing joints 2. Types and properties of plumbing joints. 3. Tools required for fixing the plumbing joints 4. Procedure of fixing the joints	1. Identify the different types of plumbing joints 2. Drawings /sketches of plumbing joints 3. Reading and interpreting the sketches/basic working drawing 4. Market survey to identify the different type of plumbing materials available to assemble joints 5. Practice of fixing of plumbing joints	10
Total			20

GRADE 10

PART A - EMPLOYABILITY SKILLS

S.No.	Units	Duration (Hrs)
1.	Communication Skills – II	20
2.	Self-management Skills - II	10
3.	Information and Communication Technology Skills – II	20
4.	Entrepreneurial Skills – II	15
5.	Green Skills - II	10
	Total	75

Unit 1: Communication Skills - II

Learning Outcome	Theory (12 hrs)	Practical (08 hrs)	Duration (20 Hrs)
1. Demonstrate the knowledge of various methods of communication	1. Methods of communication 2. Communication process and elements	1. Role-play on communication process 2. Group discussion on the effects of elements of communication cycle	05
2. Describe the types of verbal communication	1. Verbal communication 2. Types of verbal communication 3. Advantages and disadvantages of Verbal communication 4. Mastering Verbal communication	1. Role-play of a telephonic conversation 2. Chart preparation on types of verbal communication 3. Group discussion on the advantages and disadvantages of verbal communication 4. Group activity on delivering a speech and practicing public speaking.	02
3. Demonstrate the knowledge of non-verbal communication	1. Non-verbal communication 2. Importance of Non-verbal communication	1. Role play on non-verbal communication 2. Group discussion and practice on	02

	<ol style="list-style-type: none"> 3. Types of non-verbal communication 4. Visual communication 	<p>how to avoid body language mistakes</p> <ol style="list-style-type: none"> 3. Group discussion on three methods of communication 	
4. Describe the communication cycle and importance of feedback	<ol style="list-style-type: none"> 1. Communication cycle and importance of feedback 2. Feedback 3. Types of feedback Importance of feedback 	<ol style="list-style-type: none"> 1. Role play on providing feedback 2. Group activity on constructive feedback 	02
5. Identify the barriers to effective communication	<ol style="list-style-type: none"> 1. Barriers to Effective communication 2. Effective communication 3. Barriers to effective communication <ul style="list-style-type: none"> • Physical barriers • Linguistic barrier • Interpersonal barriers • Organizational barriers • Culture barriers 4. Ways to overcome barriers to effective communication 	<ol style="list-style-type: none"> 1. Role play on barriers to effective communication 2. Group activity on overcoming barriers to effective communication 3. Chart preparation on barriers to effective communication 	04
6. Demonstrate the knowledge of parts of speech	<ol style="list-style-type: none"> 1. Writing skills – Parts of speech 2. Capitalization 3. Punctuations 4. Basics of parts of speech 5. Supporting parts of speech <ul style="list-style-type: none"> • Article • Conjunctions • Prepositions • Interjections 	<ol style="list-style-type: none"> 1. Reading paragraph and sentences and identifying parts of speech 2. Group activity on sentence construction 3. Identifying nouns by guessing the name, place, animal, or thing 	03
7. Write sentences	<ol style="list-style-type: none"> 1. Writing Skills - Sentences 2. Parts of sentence 3. Types of objects 4. Types of sentences <ul style="list-style-type: none"> • Active 	<ol style="list-style-type: none"> 1. Making sentences using direct and indirect objects 2. Writing a paragraph using active and passive voice 	02

	<ul style="list-style-type: none"> • Passive 5. Paragraphs	3. Framing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative)	
Total			20

Unit 2: Self-management Skills - II

Learning Outcome	Theory (05 hrs)	Practical (05 hrs)	Duration (10 Hrs)
1. Apply stress management techniques	1. Stress management 2. Stress and Stress management techniques 3. Management technique 4. Ability to work independently 5. Emotional intelligence	1. Role Play on avoiding stressful situation 2. Activity on listing stressful situations and discussing the stress management techniques like yoga, deep breathing exercises etc.	02
2. Identify strengths and weaknesses of self	1. Self-Awareness – Strength and Weakness Analysis 2. Knowing yourself 3. Strength and weakness analysis 4. Techniques for identifying strengths and weaknesses 5. Difference between interests and abilities	1. Group discussion on aim and goal in life 2. Perform a strength and weakness analysis 3. Group discussion on interests and abilities	02
3. Demonstrate the knowledge of self-motivation	1. Self-Motivation 2. Types of motivation 3. Qualities of self-motivated people 4. Building self-motivation	1. Group discussion on staying motivated 2. Activity on listing the ways to motivate oneself	02
4. Set SMART goals	1. Self-Regulation – Goal Setting 2. Goals and Setting SMART goals 3. How to set goals <ul style="list-style-type: none"> • Specific • Measurable • Achievable • Realistic 	1. Group activity on setting SMART goals 2. Writing long- term and short-term goals 3. Activity on listing the ways to surely set SMART goals	02

	<ul style="list-style-type: none"> • Time bound 		
5. Demonstrate the knowledge of time management	<ol style="list-style-type: none"> 1. Self-Regulation – Time Management 2. Time management and its importance 3. Example and non-example of time management 4. Four steps for effective time management <ul style="list-style-type: none"> • Organise • Prioritise • Control • Track 5. Tips for practicing the four steps of effective time management 	<ol style="list-style-type: none"> 1. Preparing a list of activities to practice time management 2. Discussion on how to manage time to reach school on time 	02
Total			10

Unit 3: Information and Communication Technology Skills– II

Learning Outcome	Theory (08 hrs)	Practical (12 hrs)	Duration (20 Hrs)
1. Perform basic computer operations	<ol style="list-style-type: none"> 1. Basics computer operations 2. Computer hardware and software 3. Starting a computer 4. Shutting down a computer 5. Using keyboard 6. Using a mouse <ul style="list-style-type: none"> • Roll over or hover • Point and click • Drag and drop • Double click 	<ol style="list-style-type: none"> 1. Demonstration on use of computers 2. Group activity on using the keyboard 	12

2. Apply basic file operations	<ol style="list-style-type: none"> 1. Performing basic file operations 2. Basic File Operations 3. Files and folders <ul style="list-style-type: none"> • Creating a file • Creating a folder 	1. Practice of creating a folder	02
3. Demonstrate computer care and maintenance	<ol style="list-style-type: none"> 1. Computer care and Maintenance 2. Importance of care and maintenance of computers 3. Basic tips for taking care of devices <ul style="list-style-type: none"> • Cleaning computer devices • Preparing maintenance schedule for computers • Taking backup data • Scanning and cleaning viruses • Removing SPAM files 	1. Group activity on preparing a chart on care and maintenance of computer	03
4. Describe the importance of maintaining computer security and privacy	<ol style="list-style-type: none"> 1. Computer security and privacy 2. Computer security deals with protecting computer <ul style="list-style-type: none"> • Reasons for security breach • Threats to computer • Protecting your data 	1. Group activity on preparing an infographic chart on computer security and privacy	03
Total			20

Unit 4: Entrepreneurial Skills - II

Learning Outcome	Theory (06 hrs)	Practical (09 hrs)	Duration (15 Hrs)
1. Describe the meaning of entrepreneurship	<ol style="list-style-type: none"> 1. Entrepreneurship and society 2. Activities of entrepreneurs: <ul style="list-style-type: none"> • Fulfil customer 	1. Group work on finding the problems in school campus and turning them into business	05

	<p>needs</p> <ul style="list-style-type: none"> • Use local materials • Help society • Create job • Share wealth • Lower price product 	<p>opportunities</p>	
2. Identify the qualities and functions of an entrepreneur	<ol style="list-style-type: none"> 1. Qualities and functions of an entrepreneur 2. Qualities of an entrepreneur 	<ol style="list-style-type: none"> 1. Activity on self-assessment of entrepreneurial qualities 2. Brainstorming on solving a problem in their area 3. Taking an interview of an entrepreneur 	03
3. Describe the myths and realities about entrepreneurship	<ol style="list-style-type: none"> 1. Misconceptions and myths about entrepreneurship 	<ol style="list-style-type: none"> 1. Group activity on identifying everyday heroes 1. Activity on interviewing the entrepreneurs 2. Group activity on making items and selling to someone 	04
4. Describe entrepreneurship as a career option	<ol style="list-style-type: none"> 1. Entrepreneurship as a career option 2. Meaning of career <ul style="list-style-type: none"> • Ways of earning a living • Self-employment 3. Wage employment 4. Entrepreneur career process <ul style="list-style-type: none"> • Enter • Survive • Grow 	<ol style="list-style-type: none"> 1. Brainstorming on entrepreneurship as a life option 2. Group discussion on The power of entrepreneurship 	03
Total			15

Unit 5: Green Skills - II

Learning Outcome	Theory (07 hrs)	Practical (03 hrs)	Duration (10 Hrs)
1. Demonstrate the knowledge of green skills	<ol style="list-style-type: none"> 1. Sustainable Development 2. Importance of sustainable development 	<ol style="list-style-type: none"> 1. Group activity on creating garden in the school or planting tree saplings 2. Group discussion on 	05

	<ol style="list-style-type: none"> 3. Problems related to sustainable development 4. Sustainable development Goals 5. Sustainable development initiatives 6. Sustainable process 	“How to prevent wastage”	
2. Describe the role of self in sustainable development	<ol style="list-style-type: none"> 1. Our role in sustainable development 2. Our role towards Sustainable Development <ul style="list-style-type: none"> • Quality education • Clean water and sanitation • Affordable and clean energy • Decent work and economic growth • Reducing inequalities • Creating sustainable cities and communities • Responsible consumers and producers • Protect life below water • Protect life on land 	<ol style="list-style-type: none"> 1. Group discussion on conservation and protection of environment 2. Group activity on organizing an art project using waste 	05
Total			10

PART B: VOCATIONAL SKILLS

S. No.	Units	Duration (Hrs.)
1	Unit 1: Basic Building Construction	15
2	Unit 2: PIPES –Cutting, Threading, Joining and Testing of Pipelines	30
3	Unit 3: Plumbing and sanitary fixtures	20
4	Unit 4: Maintaining a healthy, safe and secure work environment	15
5	Unit 5: Optimum utilization of resources	15
	Total	95

Unit 1: Basic Building Construction

Learning Outcome	Theory (05 Hrs)	Practical (10 Hrs)	Duration (15 Hrs)
1. Identify different components of a building structure	1. Components of Building structure, 2. Importance and use of building components in a structure 3. Purpose and utilization of various components of building structure	1. Identification of the components of building structure 2. Draw the components of building structure	05
2. Do the cutting and opening in building structure for fixing plumbing fixtures etc.	1. Method of cutting 2. Tools used for cutting Safety during cutting and opening	1. Do the marking on structure for cutting 2. Application of tools and equipment for cutting 3. Collect the waste material and dispose at proper place	10
Total			15

Unit 2: PIPES – Cutting, Threading, Joining, and Testing of Pipelines

Learning Outcome	Theory (12 Hrs)	Practical (18 Hrs)	Duration (30 Hrs)
1. Do the cuttings of pipeline as per requirement	1. Cutting procedure of pipes	1. Cutting practice of pipes as per dimension	05
2. Do the threading of pipeline as per requirement	1. Threading procedure of pipes	1. Threading practices of pipes	05
3. Do the joining practice of pipes as per requirement	1. Joining procedure of pipes	1. Joining practices of pipes	05
4. Do the bending practice of pipes as per requirement	1. Bending procedure of pipes	1. Bending practices of pipes	05
5. Do the forming, assembling and securing practice of pipes	1. Forming, assembling and securing procedure of pipes	1. Forming, assembling and securing practices of pipes	05

as per requirement			
6. Do the testing of pipelines after installation	1. Testing procedure of pipes	1. Testing practices of pipes	05
Total			30

Unit 3: Plumbing and sanitary fixtures

Learning Outcome	Theory (08 Hrs)	Practical (12 Hrs)	Duration (20 Hrs)
1. Identify Plumbing and sanitary fixtures	<ol style="list-style-type: none"> 1. Meaning of plumbing and sanitary fixtures 2. Use of plumbing and sanitary fixtures 	<ol style="list-style-type: none"> 1. Identification of the components of Plumbing and sanitary fixtures 2. Draw the Plumbing and sanitary fixtures 	05
2. Identify type and Components of plumbing and sanitary fixtures	<ol style="list-style-type: none"> 1. Type and components of plumbing and sanitary fixtures 2. Spacing/ height to be provided among different components of a Plumbing and sanitary fixtures 	<ol style="list-style-type: none"> 1. Make a list of Plumbing and sanitary fixtures in your area 2. Collect the drawing of various types of Plumbing and sanitary fixtures 	07
3. Handle the tools used for Accessories and its type used for plumbing and sanitary fixtures	<ol style="list-style-type: none"> 1. Specification and type of tools used 	<ol style="list-style-type: none"> 2. Demonstration of opening of different Plumbing and sanitary fixtures 3. Making the drawing of different Plumbing and sanitary fixtures 1. Making a list of safety equipment 	05
4. Installation of different Plumbing and sanitary fixtures	<ol style="list-style-type: none"> 1. Method of assembling and disassembling Plumbing and sanitary fixtures 	<ol style="list-style-type: none"> 2. Demonstrate the assembly of Plumbing and sanitary fixtures 	03
Total			20

Unit 4: Maintaining a healthy, safe and secure work environment

Learning Outcome	Theory (06 Hrs)	Practical (09 Hrs)	Duration (15 Hrs)
1. Identify different types of hazards	1. Miss handling of power tool 2. Improper use of hand tool 3. Falls 4. Manual handling 5. Ladders	1. Safe handling practices, hand and power tool 2. Making of drawing of power tool	05
2. Follow the safety procedures	1. Safety check 2. Precaution at workshop 3. Reporting of injuries and disease and danger 4. Sign and symbols 5. Personnel protection equipment 6. Emergency services and first Aid	1. Identification of various types of hazard 2. Identification and Handling of personnel protective equipment 3. Handling of firefighting equipment	10
Total			20

Unit 5: Optimum utilization of resources

Learning Outcome	Theory (09 Hrs)	Practical (06 Hrs)	Duration (15 Hrs)
1. Practices and impact of inefficient utilization of material and water	1. Procedure of efficient utilization of material and water.	1. List the procedure of efficient utilization of material and water management.	02
2. Ways of efficiently managing material and water in the process	1. Efficient ways of managing material and water in the plumbing process	1. List the efficient ways of managing material and water in the plumbing process.	03

<p>3. Application of Electricals equipment's used in plumbing</p>	<ol style="list-style-type: none"> 1. Explain the basics of electricity. 2. Common electrical and thermal equipment used in a plumbing workplace. 3. Describe the use of prevalent energy efficient devices. 4. List indicators of common electrical problems. 5. Discuss common practices of conserving electricity. 6. Explain the importance of checking if the equipment. Machine is functioning normally before commencing work and ensuring it is rectified 	<ol style="list-style-type: none"> 1. List common electrical and thermal equipment used in a plumbing workplace. 2. List indicators of common electrical problems. 3. List the prevalent energy efficient devices used in plumbing. 4. List the common practices of conserving electricity. 	<p>05</p>
<p>4. Efficient waste management</p>	<ol style="list-style-type: none"> 1. Usage of different colours of dustbin 2. Recyclable and non-recyclable and hazardous waste 3. Efficient waste management practices 4. Common source of pollution 5. Common ways implied by organization to minimize waste generated from plumbing activities 	<ol style="list-style-type: none"> 1. Identify ways to optimize usages of water and other material in various tasks/activities/ process. 2. List the appropriate techniques to use energy/electricity in an optimum way. 3. Categorize waste into dry, wet, recyclable, non-recyclable and items of single-use plastics. 4. Employ effective waste management/recycling practices 	<p>05</p>
<p>Total</p>			<p>15</p>

6. ORANISATION OF FIELD VISITS

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace. Visit a Plumbing site and observe the following: Location, Site, Plumbing

site, Office building, newly constructed site, building store, Plumbing site. During the visit, students should obtain the following information from the owner or the supervisor of the Plumbing site:

1. Plumbing site activity being taken
2. Residential/Commercial project
3. Technology adopted
4. Type of material used
5. Sale procedure
6. Manpower engaged
7. Total expenditure of project
8. Total annual income
9. Profit/Loss (Annual)
10. Any other information

7. LIST OF EQUIPMENT AND MATERIALS

The tools, equipment and materials required for training are as follows:

1. Pipe wrench,
2. Parrot pliers,
3. Slide wrench,
4. Die set complete,
5. Hacksaw
6. Pipe vice,
7. Screw drivers set, D
8. Double Ended spanner set,
9. Allen Key set,
10. Drill bit set,
11. Drilling Machine,
12. Caulking tools
13. Hammers,
14. measuring tape, plumb,
15. L-Square,
16. Spirit Level,
17. Hydraulic Testing Machine,
18. Smoke Generator for testing of pipes and joints,
19. Pressure gauge,
20. Powered pipe threading machine,
21. Taps/faucets,
22. Shower head complete,
23. Sink,
24. Flushing tanks,
25. Urinal,
26. Urinal flush,
27. Bidet,
28. Bath tub,
29. Geyser,
30. Clamps and Hangers,
31. Pipes,
32. Fittings and accessories as required.

8. VOCATIONAL TEACHERS'/TRAINERS' QUALIFICATIONS AND GUIDELINES

Qualification and other requirements for appointment of vocational teachers/trainers on contractual basis should be decided by the State/UT. The suggestive qualifications and minimum competencies for the vocational teacher should be as follows:

S. No.	Qualification	Minimum Competencies	Age Limit
1.	B.Tech in Civil Engineering, Agricultural Engineering, Mechanical Engineering and B.Voc. (Bachelor in Vocation) from a recognized Institute /University, with at least 1-year work/teaching experience Or Diploma in Civil engineering / Agricultural Engineering/ Mechanical Engineering with 2 years work/teaching experience	<ul style="list-style-type: none"> • Effective communication skills (oral and written) • Basic computing skills. 	<ul style="list-style-type: none"> • Minimum 18 Years • Age relaxation to be provided as per Govt.rules.

These guidelines have been prepared with an aim to help and guide the States in engaging quality Vocational Teachers/Trainers in schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are the mode and procedure of selection of Vocational Teachers/Trainers, Educational Qualifications, Industry Experience, and Certification/Accreditation. The State may engage Vocational Teachers/Trainers in schools approved under the component of Vocationalisation of Secondary and Higher Secondary Education under RMSA in the following ways:

- (i) directly as per the prescribed qualifications and industry experience suggested by the PSS Central Institute of Vocational Education (PSSCIVE), NCERT or the respective Sector Skill Council (SSC)

OR

- (ii) through accredited Vocational Training Providers accredited under the National Quality Assurance Framework (NQAF*) approved by the National Skill Qualification Committee on 21.07.2016. If the State is engaging Vocational Teachers/Trainers through the Vocational Training Provider (VTP), it should ensure that VTP should have been accredited at NQAF Level 2 or higher.

** The National Quality Assurance Framework (NQAF) provides the benchmarks or quality criteria which the different organisations involved in education and training must meet in order to be accredited by competent bodies to provide government-funded education and training/skills activities. This is applicable to all organizations offering NSQF-compliant qualifications.*

The educational qualifications required for being a Vocational Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers / trainers deployed in the schools have relevant technical competencies for the NSQF

qualification being delivered. The Vocational Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

To ensure the quality of the Vocational Teachers/Trainers, the State should ensure that a standardized procedure for selection of Vocational Teachers/Trainers is followed. The selection procedure should consist of the following:

- (i) Written test for the technical/domain specific knowledge related to the sector;
- (ii) Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
- (iii) Practical test/mock test in classroom/workshop/laboratory.

In case of appointment through VTPs, the selection may be done based on the above procedure by a committee having representatives of both the State Government and the VTP.

The State should ensure that the Vocational Teachers/ Trainers who are recruited should undergo induction training of 20 days for understanding the scheme, NSQF framework and Vocational Pedagogy before being deployed in the schools.

The State should ensure that the existing trainers undergo in-service training of 5 days every year to make them aware of the relevant and new techniques/approaches in their sector and understand the latest trends and policy reforms in vocational education.

The Head Master/Principal of the school where the scheme is being implemented should facilitate and ensure that the Vocational Teachers/Trainers:

- (i) Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- (ii) Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- (iii) Make effective use of learning aids and ICT tools during the classroom sessions;
- (iv) Engage students in learning activities, which include a mix of different methodologies, such as project based work, team work, practical and simulation based learning experiences;
- (v) Work with the institution's management to organise skill demonstrations, site visits, on-job trainings, and presentations for students in cooperation with industry, enterprises and other workplaces;
- (vi) Identify the weaknesses of students and assist them in up-gradation of competency;
- (vii) Cater to different learning styles and level of ability of students;
- (viii) Assess the learning needs and abilities, when working with students with different abilities
- (ix) Identify any additional support the student may need and help to make special arrangements for that support;
- (x) Provide placement assistance

Assessment and evaluation of Vocational Teachers/Trainers is very critical for making them aware of their performance and for suggesting corrective actions. The States/UTs should ensure that the performance of the Vocational Teachers/Trainers is appraised annually. Performance based appraisal in relation to

certain pre-established criteria and objectives should be done periodically to ensure the quality of the Vocational Teachers/Trainers. Following parameters may be considered during the appraisal process:

1. Participation in guidance and counselling activities conducted at Institutional, District and State level;
2. Adoption of innovative teaching and training methods;
3. Improvement in result of vocational students of Grade 10 or Grade 12;
4. Continuous up-gradation of knowledge and skills related to the vocational pedagogy, communication skills and vocational subject;
5. Membership of professional society at District, State, Regional, National and International level;
6. Development of teaching-learning materials in the subject area;
7. Efforts made in developing linkages with the Industry/Establishments;
8. Efforts made towards involving the local community in Vocational Education
9. Publication of papers in National and International Journals;
10. Organisation of activities for promotion of vocational subjects;
11. Involvement in placement of students/student support services.

9. LIST OF CONTRIBUTORS

1. Er. Hemant Wadikar, Lecturer, Building Maintenance, Swami Vivekanand Jr. College (HSC Vocational) Sindhi Society, Chembur, Mumbai-400071, Maharashtra, India
2. Dr. Abhay Kumar Jha, Head, Department of Civil Engineering, Laxmi Narain College of Technology and Science, Raisen Road, Bhopal-462044, MP, India
3. Ms. Pooja Sharma, Vice President, IPSC, Okhla Industrial Area, Phase-I, New Delhi, India
4. Ms. Gunjan Aneja, Operations, Manager, IPSC, Okhla Industrial Area, Phase - I, New Delhi, India
5. Dr. Manoj Arya, Associate Professor, MANIT, Bhopal
6. Dr. Satyendra Thakur, Assistant Professor, Engineering and Technology Department, PSS Central Institute of Vocational Education, Bhopal
7. Prof. Saurabh Prakash, Coordinator and Head, Engineering and Technology Department, PSS Central Institute of Vocational Education, Bhopal.



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एन सी ई आर टी
NCERT

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal-462002, M.P., India