LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:
Web Developer
(QUALIFICATION PACK: Ref. Id. SSC/Q0503)
SECTOR: IT-ITeS

Grades XI and XII

एन सी ई आर टी
NCERT

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal – 462 002, M.P., India
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Jul, 2023

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FOREWORD

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. It is a part of Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education (CSSVSHSE) launched by the Ministry of Education, Government of India in 2012. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA). The main purpose of the competency based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject.

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 **IT-ITeS – Web Developer**. The curriculum has been developed for the secondary students of vocational education and is aligned to the National Occupation Standards (NOSs) of a job role identified and approved under the National Skill Qualification Framework (NSQF).

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 needs. The teaching process is to be performed through the interactive sessions in classrooms, practical activities in laboratories and workshops, projects, field visits, and professional experiences.

The curriculum has been developed and reviewed by a group of experts and their contributions are greatly 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 Educational Research & Training

PREFACE

India today stands poised at a very exciting juncture in its saga. The potential for achieving inclusive growth are 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. The much-discussed demographic dividend will bring sustaining benefits only if this young workforce is skilled and its potential is channelized in the right direction.

In order to fulfill the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Education (MoE), Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary 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 the responsibility to develop learning outcome based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation need 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 fulfill the needs of the society and the world of work. In order to honor its commitment to the nation, the PSSSCIVE has initiated the work on developing learning outcome based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training 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. Currently, the Institute is working on developing curricula and course-ware for over 100 job roles in various sectors.

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. We are grateful to MoE and NCERT for the financial support and cooperation in realising the objective of providing learning outcome based modular curricula and course-ware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of MoE.

Finally, for transforming the proposed curriculum design into a vibrant reality of implementation, all the institutions involved in the delivery system shall have to come together with a firm commitment and they should secure optimal community support. The success of this curriculum depends upon its effective implementation and it is expected that the managers of vocational education and training system, including subject teachers will make efforts to create better facilities, develop linkages with the world of work and foster a conducive environment as per the content of the curriculum document.

The PSSCIVE, Bhopal remains committed in bringing about reforms in the vocational education and training system through the learner-centric curricula and course-ware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st Century.

Deepak Paliwal
Joint Director
PSS Central Institute of Vocational Education

ACKNOWLEDGMENT

CONTENTS

1. COURSE OVERVIEW

COURSE TITLE: Web Developer

Web developers design and build websites. They are typically responsible for designing and maintaining web-based applications that include static and dynamic content. This includes the design, layout, and coding of a website. They test the appearance of the site and technical aspects, such as site speed and how much traffic the site can handle. The website should be visually appealing and easy to navigate, run smoothly and offer easy access points with no loading issues between pages or error messages. Web developers also create site content that requires technical features. They collaborate with website and graphic designers, monitor website traffic, troubleshoot website problems when they arise, and update websites as necessary. Every web developer should know at least the basics of these: HTML, CSS, and JavaScript for the frontend and PHP or Node. js for the backend. A full-stack web developer can do both front-end and back-end development. They may work independently or along with application/functional developers as part of the overall solution that includes a web-based component. This job may require the individual to work independently or in teams. The individual should be result oriented. The individual should also be able to demonstrate skills for communication, creative and logical thinking.

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

- ✓ Apply effective oral and written communication skills to interact with customers;
- ✓ Identify the principal components of a computer system;
- ✓ Demonstrate the basic skills of using computer;
- ✓ Demonstrate self-management skills;
- ✓ Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills;
- ✓ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ Evaluate the functioning of Business Requirement Specification, User Requirements Specification, Software Requirements Specification and Low-Level Design in the web development domain,
- ✓ Examine how assumptions, constraints, interfaces determine the process of web designing,
- ✓ Collate basic programming structures related to High Level design/Low Level Design and monitor the same,
- ✓ Examine how to create software code that is efficient, readable, and maintainable,
- ✓ Evaluate the process for converting designs into media and graphic content,
- ✓ Examine how to test new products and applications,
- ✓ Illustrate various forms of coding tools required for software applications and web designs,
- ✓ Convert requirements into web content and graphic designs,
- ✓ Discuss the technical validation of a web's HTML implementation,
- ✓ Demonstrate effective communication and collaboration with colleagues,
- ✓ Apply measures to maintain standards of health and safety at the workplace,
- ✓ Use different approaches to effectively manage and share data and information,
- ✓ Identify best practices to maintain an inclusive, environmentally sustainable workplace

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

COURSE LEVEL: This course can be taken up at Intermediate level in Grade XI and Grade XII.

COURSE DURATION: Total : **600 hours**

Grade 11 : 300 hours

Grade 12 : 300 hours

2. SCHEME OF UNITS AND ASSESSMENT

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

GRADE XI			
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory & Practical 100**
Part A	**Employability Skills**		
Unit 1	Communication Skills – III	20	**10**
Unit 2	Self-management Skills – III	15	
Unit 3	Basic ICT Skills – III	20	
Unit 4	Entrepreneurial Skills – III	20	
Unit 5	Green Skills – III	15	
	Total Hours	**90**	**10**
Part B	**Vocational Skills**		
Unit 1	Web Development Essentials	30	**40**
Unit 2	HTML and CSS	60	
Unit 3	Java Script	60	
	Total Hours	**150**	**40**
Part C	**Field Visits (3x5)**	**15**	**10**
Part D	**On the Job Training and Field Visits (3x5)**	**45**	
Part E	**Project/ Practical Work**		
	Practical File/ Student Portfolio		10
	Practical Work		10
	Written Test		10
	Viva Voce		10
	Total		**40**
	Total Hours	**300**	**100**

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

	GRADE XII		
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory & Practical 100**
Part A	**Employability Skills**		
Unit 1	Communication Skills – III	20	**10**
Unit 2	Self-management Skills – III	15	
Unit 3	Basic ICT Skills – III	20	
Unit 4	Entrepreneurial Skills – III	20	
Unit 5	Green Skills – III	15	
	Total Hours	**90**	**10**
Part B	**Vocational Skills**		
Unit 1	Relational Database Management System - MySQL	30	**40**
Unit 2	Server Side Scripting using PHP	90	
Unit 3	Health, Safety, Inclusive and Substainable Environment in Workplace	30	
	Total Hours	**150**	**40**
Part C	**Field Visits (3x5)**	**15**	**10**
Part D	**On the Job Training and Field Visits (3x5)**	**45**	
Part E	**Project/ Practical Work**		
	Practical File/ Student Portfolio		10
	Practical Work		10
	Written Test		10
	Viva Voce		10
	Total		**40**
	Total Hours	**300**	**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 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**

		No. of Questions			
	Typology of Question	**Very Short Answer (1 mark)**	**Short Answer (2 Marks)**	**Long Answer (3 Marks)**	**Marks**
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	3	2	2	13
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	2	3	2	14
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, private an example, or solve a problem)	0	2	1	07
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	2	0	04
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	**5x1=5**	**10x2=20**	**5x3=15**	**40 (20 Q)**

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 XI, Part A: Employability Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Communication Skills – III	20
Unit 2	Self-management Skills – III	15
Unit 3	Basic ICT Skills – III	20
Unit 4	Entrepreneurial Skills – III	20
Unit 5	Green Skills – III	15
Total		**90**

Unit 1: Communication Skills – III

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1	Demonstrate knowledge of communication	• Introduction to communication • Importance of communication • Elements of communication • Perspectives in communication • Effective communication	• Role-play on the communication process • Group discussion on the importance of communication and factors affecting perspectives in communication • Charts preparation on elements of communication • Classroom discussion on the 7Cs (i.e. Clear, Concise, Concrete, Correct, Coherent, Courteous and Complete) for effective communication	03
2	Demonstrate verbal communication	• Verbal communication • Public Speaking	• Role play of a phone conversation • Group activity on delivering a speech and practicing public speaking	02
3	Demonstrate non-verbal communication	• Importance of non-verbal communication, • Types of non-verbal communication, • Visual communication	• Role plays on non-verbal communication • Group exercise and discussion on Do's and Don'ts to avoid body language mistakes • Group activity on methods of communication	02
4	Demonstrate speech using correct	• Pronounciation basics, • Speaking poperly, • Phonetics,	• Group activities on practicing pronunciation	01

	pronunciation	• Types of sounds		
5	Apply an assertive communication style	• Important communication styles, • Assertive communication, • Advantages of assertive communication, • Practicing assertive communication	• Group discussion on communication styles, • Group discussion on observing and sharing communication styles	02
6	Demonstrate the knowledge of saying no	• Steps for saying "No" • Connecting words	• Group discussion on how to say 'No'	01
7	Identify and use parts of speech in writing	• Capitalisation, • Punctuation, • Basic parts of speech, • Supporting parts of speech	• Group activity on identifying parts of speech, • Writing a paragraph with punctuation marks, • Group activity on constructing sentences, • Group activity on identifying parts of speech	02
8	Write correct sentences and paragraphs	• Parts of a sentence • Types of object • Types of sentences • Paragraph	• Activity on framing sentences • Activity on active and passive voice • Assignment on writing different types of sentences.	01
9	Communicate with people	• Geetings, • Introducing self and others	• Role-play on formal and informal greetings, • Role-play on introducing someone, • Practice and group discussion on how to greet different people	01
10	Introduce yourself to others and write about oneself	• Talking about self • Filling a form	• Practicing self-introduction and filling up forms • Practicing self-introduction to others	01
11	Develop questioning skill	• Main types of questions, • Forming closed and open ended questions	• Practice exercise on forming questions, • Group activity on framing questions.	01
12	Communicate information about family to others	• Names of relatives, • Relations	• Practice taking about family, • Role-ply on talking about family members	01
13	Describe habits and routines	• Concept of habits and routines	• Group discussion on habits and routines • Group activity on describing	01

14	Ask or give directions to others	• Asking for directions, • Using landmarks	• Role-play on asking and giving directions, • Identifying symbols used for giving directions	01
			Total Duration in Hours	**20**

Unit 2: Self-management Skills – III				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (08 Hours)**	**15**
1.	Identify and analyze own strengths and weaknesses	• Understanding self • Techniques for identifying strengths and weaknesses • Difference between interests and abilities	• Activity on writing aims in life • Prepare a worksheet on interests and abilities	02
2.	Demonstrate personal grooming skills	• Guidelines for dressing and grooming • Preparing a personal grooming checklist	• Role-play on dressing and grooming standards • Self-reflection activity on various aspects of personal grooming	02
3.	Maintain personal hygiene	• Importance of personal hygiene • Three steps to personal hygiene • Essential steps of hand washing	• Role-play on personal hygiene • Assignment on personal hygiene	02
4.	Demonstrate the knowledge of working in a team and participating in group activities	• Describe the benefits of teamwork, • Working in a team	• Assignment on working in a team, • Self-reflection on teamwork	02
5	Develop networking skills	• Benefits of networking skills, • Steps to build networking skills	• Group activity on networking in action, • Assignment on networking skills	01
6	Describe the meaning and importance of self-motivation	• Meaning of self-motivation, • Types of motivation, • Steps to building self-motivation	• Activity on staying motivated, • Assignment on reasons hindering motivation	02
7	Set goals	• Meaning of goals and purpose of goal-setting, • Setting SMART goals	• Assignment on setting SMART goals, • Activity on developing long-term and short-term goals using SMART method	02
8	Apply time management strategies and techniques	• Meaning and importance of time management, • Steps for effective time management	• Preparing checklist of daily activities	02
			Total Duration in Hours	**15**

Unit 3: Information and Communication Technology Skills – III

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1.	Create a document on the word processor	- Introduction to ICT, - Advantages of using a word processor, - Work with LibreOffice Writer	- Demonstration and practice of the following: - Creating a new document - Typing text - Saving the text - Opening and saving file in Microsoft word/Libre Office Writer	02
2.	Identify icons on the toolbar	- Status bar, - Menu bar, - Icons on the Menu bar, - Multiple ways to perform a function	- Group activity on using basic user interface of LibreOffice writer - Group activity on working with Microsoft Word	02
3.	Save, close, open and print document	- Save a document, - Close a document, - Open an existing document, - Print a document	- Group activity on perform ing the functions for saving, closing and printing documents in LibreOffice Writer, - Group activity on perform ing the functions to save, close and print documents	02
4.	Format text in a document	- Change style and size of text - Align text, - Cut, Copy, Paste, - Find and replace	- Group activity on formatting text in LibreOffice Writer, - Group activity on formatting text in Microsoft Word	02
5.	Check spelling and grammar in a word document	- Use of spell checker, - Autocorrect	- Group activity on checking spellings and grammer using LibreOffice Writer - Group activity on checking spellings and grammer using Microsoft Word	02
6.	Insert lists, tables, pictures, and shapes in a word document	- Insert bullet list, - Number list, - Tables, - Pictures, - Shapes	Practical exercise of inserting lists and tables using LibreOffice Writer	03
7.	Insert header, footer and page number in a word document	- Insert header, - Insert footer, - Insert page number, - Page count	- Practical exercise of inserting header, footer and page numbers in LibreOffice Writer - Practical exercise of inserting header, footer and page numbers in Microsoft Word	03
8.	Make changes by using the track	- Tracking option - Manage option	Group activity on performing track changes in LibreOffice	04

	change option in a word document	• Compare documents	Writer • Group activity on performing track changes in Microsoft Word	
			Total Duration in Hours	15

Unit 4: Entrepreneurial Skills – III				
Sn	Learning Outcome	Theory (07 Hours)	Practical (13 Hours)	20
1.	Differentiate between different kinds of businesses	• Introduction to entrepreneurship • Types of business activities	• Role play on different kind of business around us	02
2.	Describe the significance of entrepreneurial values	• Meaning of value, • Values of an Entrepreneur, • Case study on qualities of an entrepreneur	• Role play on qualities of an Entrepreneur	02
3.	Demonstrate the attitudinal changes required to become an entrepreneur	• Difference between the attitude of entrepreneur and employee	• Interviewing employees and entrepreneurs	02
4.	Develop thinking skills like an entrepreneur	• Problems of entrepreneurs • Problem-solving, • Ways to think like an entrepreneur	• Group activity on identifying and solving problems	03
5.	Generate business ideas	• The business cycle, • Principles of idea creation, • Generating a business idea, • Case studies	• Brainstorming on generating a business ideas	03
6.	Describe customer needs and importance of conducting a customer survey	• Understanding customer needs • Conducting a customer survey	• Group activity to conduct a customer survey	04
7.	Create a business plan	• Importance of business planning, • Preparing a business plan, • Principles to follow for growing a business, • Case studies	• Group activity on developing a business plan	04
			Total Duration in Hours	20

Unit 5: Green Skills – III				
Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	15
1.	Describe the importance of the main sector of the green economy	• Meaning of ecosystem, food chain and sustainable development • Main sectors of the green economy- E-waste management, green transportation, renewal energy, green construction, and water management	• Group discussion on sectors of green economy, • Poster making on various sectors for promoting green economy	06
2.	Describe the main recommendations of policies for the green economy	• Policies for a green economy	• Group discussion on initiatives for promoting the green economy, • Writing an essay or a short note on the important initiatives for promoting green economy.	03
3.	Describe the major green sector/area and the role of various stakeholders in the green economy	• Stakeholders in the green economy	• Group discussion on the role of stakeholders in green economy • Preparation of posters on green sectors and their stakeholders • Making solar bulbs.	03
4.	Identify the role of government and private agencies in the green economy	• Role of the government in promoting a green economy, • Role of private agencies in promoting green economy	• Group discussion on the role of Government and Private Agencies in promoting a green economy. • Posters making on green sectors.	03
			Total Duration in Hours	15

GRADE XI, Part B: Vocational Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Web Development Essentials	30
Unit 2	HTML and CSS	60
Unit 3	Java Script	60
	Total Duration	**150**

Unit 1: Web Development Essentials

Sn	Learning Outcome	Theory (20 Hours)	Practical (10 Hours)	30
1.	Describe the IT-ITES industry	• Introduction to IT/ITeS Industry, • Segments of IT/ITeS Industry, • Relevance of IT/ITeS Industry, • IT application development Industry in India, • Subsectors of IT application development, • Different types of application development in IT industry, • Career path and growth opportunities for web developer • Roles and Responsibilities of Web Developer	• List and categorise the various segments of IT/ITeS industry, • List the subsectors of IT application development, • List the different types of application development in IT industry, • Prepare the chart showing the career path and growth opportunities for web developer, • List the Roles and Responsibilies of Web Developer	03
2.	Describe the process of web design and development	• Concept of web design and development, • Basic elements for web designing – overall layout, color scheme, typography, navigation content, • Constraints in Web Design, • Key assumptions for creating websites, • Interfaces of web designing process	• Illustrate the concept of web site through sample website, • Illustrate the basic elements for web designing – overall layout, color scheme, typography, navigation content, • Illustrate the process of web design	04
3.	Describe the tools of web design and development	• Web development standards and tools, • Website – static and dynamic, • Difference between static and dynamic websites, • Coding and programming for website, • Front-end development tools – HTML, CSS, Javascript, • Back-end development tools –	• Demonstrate the difference between static and dynamic websites, • List the various standards and tools for web development, • List the tools for development of static and dynamic website, • Illustrate the difference between backend and frontend tools for	04

		Python, PHP, SQL	web application development	
4.	Describe IT application development models	• Importance of SDLC models in application development, • Software Development Life Cycle (SDLC) models, • Waterfall model, • Iterative model, • Agile Model, • DevOps	• Illustrate the importance of SDLC models in application development, • Design the appropriate model for the your project on website, • Draw the process flow of acties in the project.	04
5.	Describe the specificatioins for web designing	• Businees Requirement Specifications (BRS), • Elements of Business requirement document (BRD): • Benefits of BRD, • Steps to create BRD • Steps to create URS, • Software requirement specification (SRS) • Importance of SRS document • Guidelines for writing SRS, • Creating SRS document	• List the elements of Business requirement document (BRD): • List the Benefits of BRD, • List the steps to create BRD • List the steps to create URS, • Demonstrate to prepare Software requirement specification (SRS) for a sample project	04
6.	Describe Low-level and High-level Design for Programming	• Introduction to Low-Level Design (LLD), • Object-Oriented Design, • Database Design, • API design, • Creating low-level design, • Introduction to high-level design (HLD), • Components of HLD, • Purpose of HLD, • Scope of HLD, • Characteris cs of HLD, • Requirements of/from HLD	• Demonstrate the Low-Level Design (LLD), Object-Oriented Design, Database Design, API design in the sample projecct,	04
7.	Test and identify design defects	• Design defects, • Causes of defects, • Stages of defect in software development life cycle, • Types of testing software defects – Unit testing, • Unit testing – Black box testing, White box testing, Gray box testing, • Unit testing tools, • Integration testing, • Importance of integration testing, • Different approaches and types of integration testing, • Integration testing tools, • System testing	• Identify and list the design defects and its causes, • Identify and list the stages of defect in software development life cycle, • Illustrate to test the sofware defects using appropriate type of testing, • List the various testing tools, • Illustrate to use testing tools, • Integration testing tools,	04

		• Acceptance testing		
8.	Resolve design defects	• Defect resolution, • Scope of improvement for future design, • Coding tools, • Recording and documentation of Design Defects	• Illustrate to resolve defects in your project, • Illustrate the scope of improvement for future design, • List the various coding tools, • Prepare the sample documen-tation of design defects,	03
			Total Duration in Hours	**30**

Unit 2: Web Development Tools – HTML and CSS				
Sn	**Learning Outcome**	**Theory (20 Hours)**	**Practical (40 Hours)**	**60**
1.	Create a first webpage using HTML	• HTML scipting for web page, • HTML tags and attributes, • HTML tags vs Elements. • HTML document versions	• Create your first web base using basic HTML tags, • Identify the use of applied tags in the web page	03
2.	Use HTML basic formatting tags to create web page	• HTML basic tags, • HTML formatting tags, • HTML color coding, • Div and Spn tags fro grouping	• Demonstate to use various formating and color tags to format and apply colors in the web page.	03
3.	Create list in web pages using HTML	• Concept of lists – Unordered lists, Ordered lists, Definition list, • HTML Tags for Unordered lists, Ordered lists, Definition list	• Demonstate to use list tags to create various types of lists, • Identify the difference between various types of lists.	03
4.	Embed image and hyperlinks in webpage	• Imag and Image mapping, • HTML tags for image mapping, • HTML Hyperlink, • Uniform Resource Locator(URL), • URL encoding	• Demonstrate to embed an image using image tag in the webpage, • Demonstrate to link the documents and other web pages in the web page	03
5.	Create table to represent tabular data in webpage	• Concept of table in web page, • Elements of Table, • HTML tag to create Table in webpage, • HTML Table tags - <table>, <th>, <tr>, <td>, <caption>, <thead>, <tbody>, <tfoot>, <colgroup>, <col>	• Demonstrate to create table using table tag in the web page, • Demonstrate to apply various attributes of the table tag in the web page	03
6.	Create frame in webpage using HTML tags	• Concept of frame in webpage, • HTML tag to create frame, • Attributes Using • Iframe as the Target	• Demonstrate to create the frame using Frame tage, • Demonstrate to apply various attributes of the frame tag in the web page.	03

7.	Create client side form in webpage using HTML tags	• Concept of form in webpage, • Functionality of forms to interact with wb sites, • HTML tag to create client side form - <input>, <textarea>, <button>, <select>, <label>	• Demonstrate to create client side form using the HTML tag, • Demonstrate to apply various attributes of Frame tag in the web page.	03
8.	Use Headers and Metadata of the document	• Metadata of the document – Ttile, Base, Link, Styles, Script, • HTML Meta Tag, • XHTML, • HTML deprecated tags and attribute	• Demonstrate to use Meta tag in the wen page with its various attributes	03
9.	Describe CSS to use for style and layout ot web pages	• Benefits of CSS, • CSS Versions, • CSS Syntax, • External Style Sheet using <link>, • Multiple Style Sheets, • Value lengths and percentage	• List the versions of CSS and current version, • Identify the use of CSS syntax, • Demonstrarte the impact of CSS on the web page through sample examples	04
10.	Use basic CSS to design web pages	• Basic goal of CSS, • Specific features of web pages – color, positioning, decoration, • CSS syntax for single style sheets, multiple style sheets, • Value lenths and percentage	• Demonstrate to apply specific features of CSS – color, positioning, decoration to the web page, • Demonstrate to apply CSS to single and multiple style sheets	04
11.	Define CSS selectors to apply CSS rules	• CSS slectors and CSS rules, • ID selectors, • Class selectors, • Grouping selectors, • Universal selector	• Demonstrate to apply CSS selectors and CSS rules to the web page	04
12.	Apply background and color to style elements	• Background and borders of style ements, • Background color, image, • Border lines, images • Background-image • Background-repeat, • Background-position, • CSS Cursor	• Demonstrate to apply background and color to style elements in the web page	04
13.	Use CSS Fonts to define font reqlated properties	• Font reqlated properties – style, family, size, weight, line height and glyph variants, color, background-color, text-decoration, text-align, vertical-align, text-indent, text-	• Demonstrate to apply font properties using CSS Fonts in the web page	04

Sn	Learning Outcome	Theory	Practical	
		transform, white-space, letter-spacing, word-spacing, line-height, font-family, font-size, font-style, font-variant, font-weight		
14.	Layout the table data using CSS List Table	• List table data – list-style-position, list-style-image, list-style, • CSS table – border, width & height, text-align, vertical-align, padding, color	• Demonstrate to layout table data using CSS List table.	04
15.	Use CSS Box Model	• CSS box model to define rectangular boxes, • Borders & Outline, • Margin & Padding, • Height and width, • CSS Dimesions	• Demonstrate to use CSS box model to define border & outline, mrgin & padding, height & width and other CSS dimensions in the web page	04
16.	Use CSS to display positioning	• Display positioning of elements in web page – top, right, bottom, and left properties, • CSS Visibility, • CSS Display, • CSS Scrollbars, • CSS Positioning – Static, Fixed, Relative, Absolute	• Demonstrate to use CSS display positioning property to position the element to the top, right, bottom and left.	04
17.	Use CSS Float property	• The float Property, • The clear Property, • The clearfix Hack	• Demonstrate to use CSS float property to place an element along the left or right side of its container to wrap the text.	04
			Total Duration in Hours	**60**

Unit 3: Web Development using JavaScript				
Sn	Learning Outcome	Theory (20 Hours)	Practical (40 Hours)	60
1.	Create a JavaScript template	• General overview of JavaScript, • Creating web page from Template, • Debugging, • Javascript coding, • Browser Object Model, • Window Methods, • Window Open, • Window Events,	• Demonstrate to create a Web Page from JavaScript Template, • Demonstrate to debug and produce the output of Web Page from JavaScript Template, • Write a JavaScript to move alert message to an external file, • Demonstrate to use Window methods, Window Open and Window Events in Browser	04

		• Document Object Model, • Document.Write • Get Element by ID.	Object Model, • Demonstrate to use document methods in JavaScript	
2.	Describe and use variables in JavaScript	• Keywords and reserved words, • Variable declaration and scope, • Mathematical operators used on variables, • Operator precedence, • Storing Javascript objects in variables	• List the keywords and reserved words in JavaScript, • Demonstrate to assign value to variable, • Demonstrate to use mathematical operators on variables, • Verify the precedence of operator used in variable,	04
3.	Describe and use conditional logic in expression	• If statements, • If ...Else statements, • If … Else if statements, • Comparision operators, • Ternary operators, • Logical operators, • Nested if statements, • Switch statements	• Write the script using if statement, if...else statement and if...else if statement, • Use the various comparision operators in the script and verify the output of the script, • Demonstrate the use of nested if statement and swtich statement in the script	05
4.	Describe and use the flow control in JavaScript	• Control structures, • Flow control and conditions, • For Loops, • Common End Values, • While Loops	• Demonstrate the use of for loop in the JavaScript program and verify the oputput, • Demonstrate the use of while loop in the JavaScript program and verify the oputput,	05
5.	Describe and use Arrays in JavaScript	• Creating and populating Arrays, • Array methods, • Array and Loops, • Working with Arrays	• Demonstrate to define and use array in the JavaScript, • Demonstrate to use loops in array in the JavaScript	05
6.	Describe and use Functions in JavaScript	• Defining functions, • Calling functions, • Functions as values, • Arguments and parameters, • Function scope, • Built in functions,	• Demonstrate to define and use functions in JavaScript, • Demonstrate to call function in the functio and verify the result, • Define the function argument, • Illustrate the scope of variabe in the function	05
7.	Describe string manipulation in JavaScript	• Changing Case, • IndexOf, • ChartAt, • substr, • split,	• Write the JavaScript using string manipulaton to change the case of the string, • Demonstrate the string manipulation functions with	04

		• join,	sample scripts	
8.	Describe and use Dates and Time in JavaScript	• Dates and Time, • Date Properties,	• Write a programme in JavaScript to get the Dates in various formats – Get the year, Get the month, Get the day of the month, Get the weekday	03
9.	Create forms in JavaScript	• Forms in JavaScript, • The validate function, • The checkEmail function, • The checkRadio function, • The checkDropdown function, • The checkCheckbox function	• Write a script to create a form, • Demonstrate the various function – validate, checkEmail, chekcRadio, checkDropdown, checkBox in the forms using sample script	05
10.	Manipulate image in JavaScript	• Images in the BODY tag, • Creating New Images with Javascript, • Image Rollover Effect, • Timers and Images	• Demonstrate to create image with JavaScript, • Demonstrate the Image Rollover Effect in sample script, • Demonstrate the Timers and Images in sample script	05
11.	Describe HTML Geolocation in JavaScript	• The Geolocation Object, • Error Codes, • Using the Geolocation coordinates with Google Maps, • Querystrings	• Demonstrate to use Geolocation coordinates with Google Maps	03
12.	Manipulate HTML Elements with JavaScript	• Creating Elements with JavaScript, • Creating New Text Nodes, • Adding the New Text to your New Element, • Inserting the New HTML into the Body	• Demonstrate to create and manage elements with JavaScript	03
13.	Using HTML5 Canvas tag in JavaScript	• Getting Started with the Canvas Tag, • Drawing Shapes – Rectangles, • Drawing Shapes – Circles and Arcs, • Drawing Paths and Lines, • Line Caps and Line Joins, • Line Joins, • Gradients, • Using Images with the Canvas Tag, • Image Patterns, • Draw Image, • Image Scaling,	• Demonstrate to use Geolocation object in JavaScript, • Demonstrate to manipulate HTML Elements with Javascript, • Demonstrate to draw Rectangle, Circle, Arcs, Paths, Lines, Line Caps and Line Joins using various methods in JavaScript, • Demonstrate to scale image, slice image in JavaScript, • Demonstrate the simple animation of Timers and,	08

		• Image Slicing, • Simple Animation – Timers, • Simple Animation – Keyboard keys, • Detecting Key Events, • Detecting Mouse Events, • Detecting Touch Events, • Adding Text to a Canvas, • Text Alignment, • Text Baseline, • Drop Shadows, • Image Shadows	Keyboard in JavaScript, • Demonstrate to detect Key Events, Mouse Events and Touch Events in JavaScript, • Demonstrate to add Text to a Canvas in JavaScript, • Demonstrate to Align Text, Baseline, Drop Shadows, Image Shadows in JavaScript	
14.	Using JavaScript Libraries	• Javascript libraries, • How to use Javascript libraries	• List and use the various libraries in JavaScript	01
			Total Duration in Hours	**60**

GRADE XII, Part A: Employability Skills

Unit No.	Unit Name	Duration (Hrs.)
Unit 1	Communication Skills – IV	20
Unit 2	Self-management Skills – IV	15
Unit 3	Basic ICT Skills – IV	20
Unit 4	Entrepreneurial Skills – IV	20
Unit 5	Green Skills – IV	15
	Total Hours	**90**

Unit 1: Communication Skills – IV				
Sn	**Learning Outcome**	**Theory (08 Hours)**	**Practical (12 Hours)**	**20**
1.	Demonstrate active listening skills	• Active listening -listening skill, stages of active listening, • Overcoming barriers to active listening	• Group discussion on the factors affecting active listening, • Preparing posters of steps for active listening, • Role-play on negative effects of not listening actively	07
2.	Identify the parts of speech	• Parts of speech – using capitals, punctuation, basic parts of speech, supporting parts of speech	• Group practice on identifying parts of speech • Group practice on constructing sentences	07
3.	Write sentences	• Writing skills to practice the following: • Simple sentence	• Group activity on writing sentences and paragraphs, • Group activity on practicing	06

			writing sentences in active or passive voice,	

		• Complex sentence
		• Types of object
		• Identify the types of sentences
		   • Active and Passive sentences
		   • Statement/Declarative sentence
		   • Question/Interrogative sentence
		   • Emotion/Reaction or Exclamatory sentence
		   • Order or Imperative sentence
			• Group activity on writing different types of sentences (i.e., declarative, exclamatory, interrogative and imperative)	

			Total Duration in Hours	**20**

Unit 2: Self-management Skills – IV

Sn	Learning Outcome	Theory (07 Hours)	Practical (08 Hours)	15
1.	Describe the various factors influencing motivation and positive attitude	• Motivation and positive attitude • Intrinsic and extrinsic motivation • Positive attitude – ways to maintain positive attitude • Stress and stress management - ways to manage stress	• Role Play on avoiding stressful situation, • Activity on listing negative situations and ways to turn it positive	06
2.	Describe how to become result oriented	• How to become result oriented, • Goal setting – examples of result-oriented goals	• Pair and share activities on the aim of life	03

3.	Describe the importance of self-awareness and the basic personality traits, types and disorders	• Steps towards self-awareness
		• Personality and basic personality traits
		• Common personality disorders-
		   • Suspicious
		   • Emotional and impulsive
		   • Anxious
		• Steps to overcome personality disorders
			• Group discussion on self awareness
			• Group discussion on common personality disorders
			• Brainstorming steps to overcome personality disorder
				06

			Total Duration in Hours	**15**

Unit 3: Information and Communication Technology Skills – IV

Sn	Learning Outcome	Theory (06 Hours)	Practical (14 Hours)	20
1.	Identify the components of a	• Getting started with spreadsheet – types of a	• Group activity on identifying components of spreadsheet in	02

		spreadsheet application	spreadsheet, components of a worksheet, • Starting LibreOffice Calc • Creating a worksheet	LibreOffice Calc	
2.	Perform basic operations in a spreadsheet		• Opening workbook and entering data – types of data, steps to enter data, editing and deleting data in a cell • Selecting multiple cells • Saving the spreadsheet in various formats • Closing the spreadsheet • Opening the spreadsheet. • Printing the spreadsheet.	• Group activity on working with data on LibreOffice Calc	03
3.	Demonstrate the knowledge of working with data and formatting text		• Using a spreadsheet for addition – adding value directly, adding by using cell address, using a mouse to select values in a formula, using sum function, copying and moving formula • Need to format cell and content • Changing text style/font size • Align text in a cell • Highlight text	• Group activity on formatting a spreadsheet in LibreOffice Calc • Group activity on performing basic calculations in LibreOffice Calc.	02
4.	Demonstrate the knowledge of using advanced features in spreadsheet		• Sorting data, • Filtering data, • Protecting spreadsheet with password	• Group activity on sorting data in LibreOffice Calc	03
5.	Make use of the software used for making slide presentations		• Available presentation software • Stapes to start LibreOffice Impress • Adding text to a presentation	• Group practice on working with LibreOffice Impress tools, • Group practice on creating a presentation in LibreOffice Impress	02
6.	Demonstrate the knowledge to open, close and save slide presentations		• Open, Close, Save and Print a slide presentation	• Group activity on saving, closing and opening a presentation in LibreOffice Impress	01
7.	Demonstrate the operations related to slides and texts in the presentation		• Working with slides and text in a presentation- adding slides to a presentation, deleting slides, adding and formatting text, highlighting text, aligning	• Group practice on working with font styles and types in LibreOffice Impress	04

8.	Demonstrate the use of advanced features in a presentation	• Advanced features used in a presentation, • Inserting shapes in the presentation, • Inserting clipart and images in a presentation, • Changing slide layout	• Group activity on changing slide layout on LibreOffice Impress	03
			Total Duration in Hours	**20**

Unit 4: Entrepreneurial Skills – IV

Sn	Learning Outcome	Theory (08 Hours)	Practical (12 Hours)	20
1.	Describe the concept of entrepreneurship and the types and roles and functions entrepreneur	• Entrepreneurship and entrepreneur • Characteristics of entrepreneurship • Entrepreneurship-art and science • Qualities of a successful entrepreneur • Types of entrepreneurs • Roles and functions of an entrepreneur • What motivates an entrepreneur • Identifying opportunities and risk-taking • Startups	• Group discussion on the topic "An entrepreneur is not born but created". • Conducting a classroom quiz on various aspects of entrepreneurship. • Chart preparation on types of entrepreneurs • Brainstorming activity on What motivates an entrepreneur	08
2.	Identify the barriers to entrepreneurship	• Barriers to entrepreneurship, • Environmental barriers, • No or faulty business plan, • Personal barriers	• Group discussion about "What we fear about entrepreneurship" • Activity on taking an interview of an entrepreneur.	04
3.	Identify the attitude that make entrepreneur successful	• Entrepreneurial attitude	• Group activity on identifying entrepreneurial attitude.	04
4.	Demonstrate the knowledge of entrepreneurial attitude and competencies	• Entrepreneurial competencies • Decisiveness, • Initiative • Interpersonal skills-positive attitude, stress management • Perseverance	• Playing games, such as "Who am I". • Brainstorming a business ideas • Group practice on "Best out of Waste" • Group discussion on the topic	04

		• Organisational skills- time management, goal setting, efficiency, managing quality.	of "Let's grow together" • Group activity on listing stress and methods to deal with it like Yoga, deep breathing exercise.	
			Total Duration in Hours	**Expression is faulty**

Unit 5: Green Skills – IV				
Sn	**Learning Outcome**	**Theory (05 Hours)**	**Practical (10 Hours)**	**15**

1.	Identify the benefits of the green jobs	• Green jobs
		 • Benefits of green jobs
		 • Green jobs in different sectors:
		   • Agriculture
		   • Transportation
		   • Water conservation
		   • Solar and wind energy
		   • Eco-tourism
		   • Building and construction
		   • Solid waste management
		   • Appropriate technology
			• Group discussion on the importance of green job,
			 • Chart preparation on green jobs in different sectors.
				08

2	State the importance of green jobs	• Importance of green jobs in
		   • Limiting greenhouse gas emissions,
		   • Minimizing waste and pollution,
		   • Protecting and restoring ecosystems,
		   • Adapting to the effects of climate change
			• Preparing posters on green jobs,
			 • Group activity on tree plantation.
			 • Brainstorming different ways of mininmising waste and pollution
				07

			Total Duration in Hours	15

GRADE XII, Part B: Vocational Skills

Sn	Units	Duration in Hours
Unit 1	Relational Database Management System - MySQL	30
Unit 2	Server Side Scripting using PHP	90
Unit 3	Health, Safety, Inclusive and Substainable Environment in Workplace	30
	Total Duration	**150**

	Unit 1: Relational Database Management System - MySQL			
Sn	Learning Outcome	Theory (15 Hours)	Practical (25 Hours)	30
1	Describe the database management concepts	• Introduction to database systems, • File system and its limitations • Database management systems (DBMS), • Limitations, advantages and disadvantages of DBMS, • Comparison of DBMS with File System, • Concepts in DBMS, • Relational data model, • Keys in Relational database – Candidate key, Primary key, Composite Primary Key, Foreign Key	• List the requirement of database system, • List and compare the the various DBMS • List the uses of DBMS in real life, • Prepare the database table of real life examples – relatives, friends, classmates, telephone, • Identify the fields and records in the database table, • Identify the primary key and other keys in the database table,	10
2	Describe Structured Query Language	• Structured Query Language (SQL) • Installing RDBMS package (MySQL), • Data Types and Constraints in MySQL • Types of SQL – DDL, DML, DQL, TCL, DCL • Data Definition Language (DDL) commands, • Data Manipulation Language (DML) commands, • Data Query Language (DQL) commands, • Data Control Language (DCL) commands, • Transaction Control Language (TCL) commands.	• List and identify different data types in SQL, • List and identify various constraints in data table, • Use DDL commands to create Database, Table, View, • Use Alter command to modify table structure, • Use Drop and Truncate command on Table, • Use DML commands to insert data records in Table, • Use Update and Delete command to modify the data records, • Use DCL command Select to retrieve data records, • Use DCL command Grant and Revoke to authorise and withdraw privileges for data	10

Sn				
			operation, • Use TCL command Commit to save, Rollback and SavePoint command to undo the data transaction in Table	
3	Use functions in SQL	• SQL functions - Single Row Functions and Aggregate functions, • Single Row Functions – Math Functions, String Functions, Date and Time Functions, • Aggregate Functions • GROUP BY clause in SQL • Operations on Relations – Union, Intersect, Minus, Cartesian Product • Using two relations in a query - JOIN on two tables,	• List the various Single Row Functions and Aggregate functions, • Demonstrate to use math functions, • Demonstrate to use string functions, • Demonstrate to use Date and Time functions, • Demonstrate to use Aggregate functions in SQL • Demonstrate to join two tables in SQL	10
			Total Duration in Hours	**30**

Unit 2: Server Side Scripting using PHP (Basic)				
Sn	**Learning Outcome**	**Theory (40 Hours)**	**Practical (50 Hours)**	**90**
1.	Overview of PHP	• Overview of PHP, • Installtion of PHP, • Installing and Testing Wampserver, • Launcing your PHP scripts, • Variables in PHP, • Testing variables with PHP, • Joining direct text and variable data, • Adding, subtracting, dividing and multiplying variable data	• List the versions of PHP, • Demonstrate to install and Test PHP and Wamp server, • Illustrate th use of variables through sample script, • Illustrate to joining direct text and variable data in PHP, • Write a script to add up the figures, numbers, calculate expression	08
2.	Use Conditional Logic in PHP	• Conditional Logic, • If Statements, • Using If Statements, • if … else Statements, • if … else if Statements, • Using Comparison Operators in Conditional Logic, • Operator Precedence, • Conditional Logic in HTML Form,	• Demonstrarte to use conditional logic in PHP script, • Demonstrarte to use conditional logic in HTML Forms, • Demonstrarte to handle Form Elements with PHP	08
3.	Use Loops in PHP script	• Advantage of using Loops in PHP, • For Loops, • While Loops, • Do While loops,	• Illustrate with example to use For Loop in PHP scripting, • Illustrate with example to use While Loop in PHP scripting,	08

		• The break statement, • For Each	• Illustrate with example to use Do While Loop in PHP, • Illustrate with example to use break statement in PHP	
4.	Use Arrays in PHP	• Arrays in PHP, • Setting up an Array, • Arrays - Using Text as Keys, • Arrays and For Each, • Sorting Array values, • Random Keys from an Array, • Various examples of array by using PHP script.	• Demonstrate to install software using Group Policy, • Write a PHP script to set up an array and print out the values, • Write a PHP script to set up an array with your own Keys, • Write a PHP script to Set up an array with mixed values • Write a PHP script to Assign values to an array: Method, • Write a PHP script to Looping round values in an array, • Write a PHP script to Looping round an Associative array using For Each • Write a PHP script to sorting Arrays (Associative), • Write a PHP script to sort Arrays (Scalar)	10
5.	Manipulate String in PHP	• String Manipulation, • Changing Case, • Trimming White Space, • Shuffle characters, • Finding one string inside of another, • Splitting a line of text, • Joining text into a single line, • PHP and Escaping, • Various string functions with syntax,	• Illustrate to change text case in PHP • Illustrate to Trim White Space, • Illustrate to Shuffle characters, • Illustrate to Find one string inside of another, • Illustrate to Split a line of text, • Illustrate to Join text into a single line, • Illustrate to use various string functions in PHP	08
6.	Use Functions in PHP	• Functions in PHP, • Variable scope and functions, • Functions and arguments, • A Function to check for blank Textboxes, • Getting values out of functions, • Function By Ref, By Val, • PHP Server Variables, • HTTP Header() Function, • Security Issues and Form Elements	• Illustrate the scope of variable in functions, • Identify and specify the arguments in Function, • Write a Function to check for blank Textboxes, • Illustarte to get values out of functions, • Identify and list PHP Server Variables, • HTTP Header() Function, • Demonstrate to use functions in Form Elements	10
7.	Work with Files in PHP	• Opening a file, • Writing to files,	• Demonstrate to create and use files in PHP,	10

Sn	Learning Outcome	Theory	Practical	
		• Working with Comma delimited files (CSV files), • Reading a text file line by line into an array – other options, • File Locations	• Write a PHP code to perform various operations on file	
8.	Work with Date and Time functions in PHP	• The date( ) function, • Date and time characters, • getdate( ) function, • Examples of using date() function in PHP	• Demonstrate to use date( ) function in PHP, • Write the PHP script to print the date and time characters, • Write the PHP script to use getdate( ) function	10
9.	Connect to databases in PHP	• Creating a database using phpMyAdmin, • Setting up Fields in your database tables, • Adding records to a MySQL Table	• Demonstrate to create database using phpMyAdmin, • Demonstrate to Setup Fields in database tables, • Adding records to a MySQL Table	08
10.	Manipulate MySQL databases in PHP	• How to access a MySQL database with PHP code, • Reading records from a database, • Structured Query Language, • Adding records to a database table, • Inserting values in the fields, • Using HTML Forms with Database, • Magic Quotes, • SQL injection	• Demonstrate to access a MySQL database with PHP code, • Wrte PHP code to read records from a database, • Illustrate to use Structured Query Language (SL) in PHP, • Write PHP code to add records to a database table and insert values in the fields, • Demonstrate to use HTML Forms with Database in PHP	10
			Total Duration in Hours	**90**

Unit 3: Health, Safety, Inclusive and Substainable Environment in Workplace				
Sn	Learning Outcome	Theory (15 Hours)	Practical (15 Hours)	30
1.	Achieve optimum productivity and quality	• Importance of cleanliness, air and water quality in the workplace, • Importance of time management to meet daily target, • Importance of Quality in delivery of work, • Organization's policies and procedures and work ethics	• Group activity to keep work area clean and tidy, • Prepare a to do list and demonstrate to complete work effectively in time to meet daily target, • Check the quality of work with the expected standards, • Group activity to comply with organization's policies and procedures	05
2.	Explain the	• Organisation safety and health	• Group acticity to observe and	05

	importance of implementing health and safety procedures	policy, • Appropriate Personal Protective Equipment (PPE) • ESD precautions, • Types of accident injury or hazard	follow organisation safety guidelines, • Demonstrate the use of proper personal protective equipment (PPE) for safety • Demonstrate to observe ESD precautions, • Identify and report any accident injury or hazard	
3.	Demonstrate the process of organizing waste management and recycling	• Recyclable/non-recyclable and hazardous wastes, • Different waste categories – dry, wet, recyclable, non-recyclable and single use plastic items, • Different colours of dustbins to dispose waste, • Waste management and waste disposal procedures, • Methods of recycling as well as repairing and reusing electronic components, • Effect of greening of jobs	• Identify and segregate recyclable/non-recyclable and hazardous wastes, • Group activity to dispose waste as per the procedures, • Demonstrate to use appropriate colours of dustbins to dispose waste, • Group activity to recyclie, repair and reuse electronic components, • Participate in waste management and waste disposal workshops organised at workplace	05
4.	Explain the importance of conserving resources	• Efficient utilisation of material and water, • Prevalent energy efficient devices, • Common electrical problems, • Cleaning of tools, machines and equipment • Common practices of conserving electricity	• Group activity to demonstrate efficient utilisation of resources, material and water, • Make the list of equivalent energy efficient devices, • Perform routine cleaning of tools, machines and equipment • Demonstrate the common practices of conserving electricity.	05
5.	Respect diversity and strengthen practices to promote equality	• Concept of gender, gender equality and gender discrimination, • Policies and procedures about gender inclusivity, equality and sustainability while working with colleagues, • Organisation facilities to women employee, • All forms of gender discrimination, violence and inequality	• List the scenario about how to implement the gender equality, gender inclusivity, equality and sustainability while working with colleagues, • Illustrate to implement organisation facilities to women employee, gender discrimination, violence and equality, • Illustrate to use internal & external communication to	05

		• Use internal & external communication to colleagues	colleagues	
6.	Comply to PWD Inclusive Policies	• How to maintain and provide a conducive work environment that is free from any harassment, facilies and amenies to PWD, specifically designed recruitment practices, PWD friendly infrastructure • Appropriate verbal/ nonverbal communication, schemes and benefits of PWD	• Illustrate to maintain and provide a conducive work environment that is free from any harassment, facilies and amenies to PWD specifically designed recruitment practices, PWD friendly infrastructure, • Illustrate to implement appropriate verbal/ nonverbal communication, schemes and benefits of PWD in website	05
			Total Duration in Hours	**30**

6. ORGANISATION OF FIELD VISITS and OJT

In a year, at least 3 field visits/educational tours and On-the-Job-Training (OJT) in vacation should be organised for the students to expose them to the activities in the workplace. Visit a service centre of home appliances and observe the following: Location, Site, home appliances, tneir installation, repair and maintenance. Students should achive the following outcomes.

1. Explain the use of appropriate tools, parts, relevant reference sheets, manuals and documents.
2. Disposing the packaging material waste as per the company's norms.
3. Perform basic inspection of the feed water valve, tank valve, tubing, housing etc. to diagnose reasons for low/no water production
4. Identify reasons for leaks in the filter housing due to loose housing, damaged or misaligned Oring, cracks in the housing
5. Detect worn-out auto shut off valve through symptoms such as loud vibrating noise, drain water never shutting off etc.
6. Detect other problems such as clogged filters, storage tank problems, clogged flow resistor, inadequate/excessive water pressure, improper saddle valve mounting etc
7. Detect basic electrical faults such as improper/no earth, defective power cord, connector or internal wiring defect, short/ loose/open contacts, blown fuse
8. Inspect each module of the unit separately if the fault is not identified through basic tests.
9. Communicate effectively at the workplace.
10. Apply health and safety practices at the workplace.

7. LIST OF EQUIPMENT AND MATERIALS

The list given below is suggestive and an exhaustive list should be prepared by the vocational teacher. Only basic tools, equipment and accessories should be procured by the Institution so that the routine tasks can be performed by the students regularly for practice and acquiring adequate practical experience.

Classroom Aids	Tools, Equipment and Other Requirements:
• Whiteboard and Markers	• PCs/Laptops

• Chart paper and sketch pens • LCD Projector and Laptop for presentations	• Internet with Wi-Fi (Min 2 Mbps Dedicated) • Microphone / voice system for lecture and class activities • Computer Lab with 1:1 PC: trainee ratio and having internet connection, MS Office / Open office, Browser, • Outlook / Any other Email Client, and chat tools • HTML5, Javascript, CSS, SQL, Web Builder, Word Press, Joomla and modelling tools such as Visio, UML • Flash, Photoshop, Windows media player, Eclipse, XAMPP.

Classroom Aids

Training Kit - Trainer Guide, Presentations, Whiteboard, Marker, Projector, Laptop

8. TEACHER'S/TRAINER'S QUALIFICATION

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:

Minimum Educational Qualification	Specialization	Age Limit	Industry Experience		Training Experience	
			Years	*Specialization*	*Years*	*Specialization*
Bachelor Degree in Computer Science/ IT **OR** Certified in relevant CITS course, **OR** SSC Certified on the said job role with Minimum accepted score is 80%	Web design and development /media design. Good communication skills in English and regional language, Practical skilled to handle and operate tools and equipment with safety	18-37 years (as on January 1 of current year) Age relaxation to be provided as per Govt. rules	2 Year	Web application development	2 Year	Certification in relevant software competencies:

Note – The qualifications for vocational teachers mentioned above is suggestive and not prescriptive. The States/ UTs can make modifications in the qualifications for appointment of vocational teachers/ trainers as per their requirement through a committe appointed by the competent authority in the State/ UT Directorate/ Department of School Education.

Vocational Teachers/Trainers form the backbone of Vocational Education being imparted as an integral part of Rashtriya Madhyamik Shiksha *Abhiyan* (RMSA). They are directly involved in teaching of vocational subjects and also serve as a link between the industry and the schools for arranging industry visits, On-the-Job Training (OJT) and placement.

These guidelines have been prepared with an aim to help and guide the States in engaging quality Vocational Teachers/Trainers in the schools. Various parameters that need to be looked into while engaging the Vocational Teachers/Trainers are 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 following ways:

1. 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**

2. 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:

1. Written test for the technical/domain specific knowledge related to the sector;
2. Interview for assessing the knowledge, interests and aptitude of trainer through a panel of experts from the field and state representatives; and
3. 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:

- Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- Make effective use of learning aids and ICT tools during the classroom sessions;
- 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;

- 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;
- Identify the weaknesses of students and assist them in up-gradation of competency;
- Cater to different learning styles and level of ability of students;
- Assess the learning needs and abilities, when working with students with different abilities
- Identify any additional support the student may need and help to make special arrangements for that support;
- 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:

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

9. LIST OF CONTRIBUTORS

The curriculum was developed by the,

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