LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE

CYBER SECURITY ASSISTANT

Qualification Pack
QG-03-IT-00350-2023-V1-NIELIT

Sector: IT-ITeS
Grades: IX and X

विद्यया ऽ मृतमश्नुते

एन सी ई आर टी
NCERT

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
(a constituent unit of NCERT, under Ministry of Education, Government of India)
Shyamla Hills, Bhopal- 462 002, M.P., INDIA
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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 education 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 Qualification 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 education and training package for the job role/vocational subject of **"IT-ITeS – Cyber Security Assistant"**. The curriculum has been developed for the secondary students of Grades 9 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, Government of India introduced the revised Centrally Sponsored Scheme of Vocationalisation of School Education under Samagra Shiksha. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted with the responsibility of developing learning outcomebased curricula, student textbooks and e-learning materials for the 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. 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 and foster a conducive learning environment 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) and Media and Entertainment Skills Council (MESC) for their academic support and cooperation.

We are grateful to the expert contributors and Dr. Munesh Chandra, Professor (CSE), PSSCIVE, for their earnest effort and contributions in the development of this learning outcome-based curriculum. Their contributions are dully acknowledged.

The contributions made by Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC), Pinki Khanna, Professor and Head, Programme Planning and Monitoring Cell (PPMC) and Dr. Munesh Chandra, Professor (CSE) and Head, ICT and Computer Centre, PSSCIVE in development of the curriculum for the employability skills are duly acknowledged.

We are also grateful to the Course Coordinator Dr. Munesh Chandra, Professor (CSE), Head, ICT and Computer Centre, Department of Engineering and Technology, PSSCIVE, for bringing out this curriculum in the final form.

CONTENTS

1. COURSE OVERVIEW

COURSE TITLE: CYBER SECURITY ASSISTANT

A Cyber Security Assistant plays a vital support role in maintaining the security posture of an organization's digital infrastructure. They assist senior cybersecurity professionals in monitoring systems, identifying vulnerabilities, and responding to security incidents. Their primary responsibilities include helping with system audits, tracking threats, managing access controls, and supporting the implementation of security protocols and best practices.

Cyber Security Assistants may work with tools for intrusion detection, malware analysis, and network monitoring. They assist in creating security documentation, preparing reports, and ensuring compliance with internal policies and external regulations. In addition, they help conduct regular risk assessments and update security software and patches as directed.

Strong analytical skills, attention to detail, and the ability to follow established procedures are essential. A Cyber Security Assistant should also have a foundational understanding of networking concepts, operating systems (especially Windows and Linux), and security principles. Familiarity with scripting languages such as Python or Bash is a plus. The role often serves as a stepping stone into more advanced cybersecurity positions and may involve working independently or as part of a cybersecurity or IT team.

Cyber Security Assistants must possess strong communication skills, a proactive mindset, and a willingness to learn continuously in a fast-evolving threat landscape.

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

1. Understand fundamental cybersecurity concepts and terminology.
2. Identify common cyber threats, vulnerabilities, and attack vectors.
3. Apply basic network security practices and protocols.
4. Use security tools to monitor and analyze system activity.
5. Assist in managing user access controls and permissions.
6. Support the implementation of security policies and procedures.
7. Perform basic risk assessments and vulnerability scans.
8. Respond to low-level security incidents under supervision.
9. Maintain and update antivirus and security software.
10. Document security findings and prepare simple reports.
11. Demonstrate basic skills in Linux and Windows system security.
12. Follow ethical practices and maintain confidentiality in handling data.

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

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

COURSE DURATION: Total : 240 hours

Grade IX : 120 (60 Theory + 60 Practical) hours

Grade X : 120 (52 Theory + 68 Practical) 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 IX and X opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Grade IX is as follows :

GRADE IX			
Units		**No. of Hours for Theory and Practical 200**	**Max. Marks for Theory & Practical 100**
Part A	**Employability Skills**		
Unit 1	Communication Skills – I	15	10
Unit 2	Self-management Skills – I	10	
Unit 3	Information and Communication Technology Skills – I	10	
Unit 4	Entrepreneurial Skills – I	15	
Unit 5	Green Skills – I	10	
	Total Hours	**60**	**10**
Part B	**Vocational Skills**		
Unit 1	Fundamentals of Operating Systems and Computer Networks	**120**	40
	Total Hours	**120**	**40**
Part C	**Field Visits (3x5)**	**15**	**10**
Part D	**On the Job Training**	**05**	
Part E	**Project/ Practical Work**		
	Practical File/ Student Portfolio		10
	Practical Work		10
	Written Test		10
	Viva Voce		10
	Total		**40**
	Total Hours	**200**	**100**

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

GRADE X			
Units		**No. of Hours for Theory and Practical 200**	**Max. Marks for Theory & Practical 100**
Part A	**Employability Skills**		
Unit 1	Communication Skills – II	15	10
Unit 2	Self-management Skills – II	10	
Unit 3	Information and Communication Technology Skills – II	10	
Unit 4	Entrepreneurial Skills – II	15	
Unit 5	Green Skills – II	10	
	Total Hours	**60**	**10**
Part B	**Vocational Skills**		
Unit 1	Cyber Security	120	40
	Total Hours	**120**	**40**
Part C	**Field Visits (3x5)**	**15**	**10**
Part D	**On the Job Training**	**05**	
Part E	**Project/ Practical Work**		
	Practical File/ Student Portfolio		10
	Practical Work		10
	Written Test		10
	Viva Voce		10
	Total		**40**
	Total Hours	**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 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 IX, Part A: Employability Skills

Unit No.	Unit Name	Duration in Hours
Unit 1	Communication Skills – I	15
Unit 2	Self-management Skills – I	10
Unit 3	Information and Communication Technology Skills – I	10
Unit 4	Entrepreneurial Skills – I	15
Unit 5	Green Skills – I	10
	Total	**60**

Unit 1: Communication Skills – I				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (08 Hours)**	**15**
1.	Demonstrate knowledge of various methods of communication	• Methods of communication ○ Verbal ○ Non-verbal ○ Visual	• Writing pros and cons of written, verbal and non-verbal communication • Listing do's and don'ts for avoiding common body language mistakes.	04
2.	Identify elements of communication cycle	• Meaning of communication • Importance of communication skills • Elements of communication cycle ○ Sender, ○ Ideas, ○ Encoding, ○ Communication channel, ○ Receiver, ○ Decoding, and ○ Feedback	• Draw a diagram of communication cycle • Role plays on communication process related to the sector/job role	03
3.	Identify the factors affecting our perspectives in communication	• Perspectives in communication • Factors affecting perspectives in communication ○ Visual perception ○ Language ○ Past experience ○ Prejudices ○ Feelings ○ Environment	• Group discussion on factors affecting perspectives in communication • Sharing of experiences on factors affecting perspectives • Sharing experiences on factors affecting communication at workplace.	04

4.	Demonstrate the knowledge of basic writing skills	• Writing skills related to the following: ○ Phrases ○ Kinds of sentences ○ Parts of sentence ○ Parts of speech ○ Use of articles ○ Construction of a paragraph	• Demonstration and practice of writing sentences and paragraphs on topics related to the subject	04
	Total Duration in Hours			**15**

Unit 2: Self-management Skills – I				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (03 Hours)**	**10**
1.	Identify and analyze own strengths and weaknesses	• Meaning of self-management • Positive results of self-management • Self-management skills.	• Identification of self-management skills • Strength and weakness analysis.	05
2.	Demonstrate personal grooming skills	• Factors that help in building self-confidence, social, cultural, and physical factors • Self-confidence building tips getting rid of the negative thoughts, thinking positively, staying happy with small things, staying clean, hygienic and smart, chatting with positive people, etc,	• Role play exercises on building self-confidence • Use of positive metaphors/ words • Positive stroking on wakeup and before going bed • Helping others and working for community.	05
	Total Duration in Hours			**10**

Unit 3: Information and Communication Technology Skills – I				
Sn	**Learning Outcome**	**Theory (06 Hours)**	**Practical (04 Hours)**	**10**
1.	Describe the role of Information and Communication Technology (ICT) in day-to-day life and workplace	• Introduction to ICT • Role and importance of ICT in personal life and at workplace • ICT in our daily life (examples) • ICT tools - Mobile, tab, radio, TV, email, etc	• Discussion on the role and importance of ICT in personal life and at workplace. • Preparing posters / collages for showing the role of ICT at workplace	03

2.	Identify components of basic computer system and their functions	• Computer system - Central Processing Unit (CPU), memory, motherboard, storage devices • Hardware and software of a computer system • Role and functions of Random-Access Memory (RAM) and Read Only Memory (ROM) • Role and functions of Central Processing Unit • Procedure for starting and shutting down a computer	• Connecting the cables and peripherals to the Central Processing Unit • Starting and shutting down a computer • Group discussion on the various aspects of hardware and software.	03
3.	Demonstrate use of various components and peripherals of computer system	• Peripherals devices and their uses – mouse, keyboard, scanner, webcam, etc. of a computer system	• Identification of various parts and peripherals of a computer • Demonstration and practice on the use of mouse • Demonstration and practice on the use of keyboard • Demonstration of the uses of printers, webcams, scanner and other peripheral devices • Drawing diagram of computer system and labelling it.	02
4.	Demonstrate basic computer skills	• Primary operations on a computer system – input, process, storage, output, communication networking, etc.	• Identification of the various input and output units and explanation of their purposes	02
	Total Duration in Hours			**10**

Unit 4: Entrepreneurial Skills – I				
Sn	**Learning Outcome**	**Theory (06 Hours)**	**Practical (09 Hours)**	**15**
1.	Identify various types of business activities	• Types of businesses – service, manufacturing, hybrid • Types of businesses found in our community • Business activities around us	• Prepare posters of business activities found in cities/villages, using pictures • Discuss the various types of activities, generally adopted by small businesses in a local community	09

			• Best out of waste • Costing of the product made out of waste • Selling of items made from waste materials • Prepare list of businesses that provides goods and services in exchange for money.	
2.	Demonstrate the knowledge of distinguishing characteristics of entrepreneur-ship	• Meaning of entrepreneurship development • Distinguishing characteristics of entrepreneurship • Role and rewards of entrepreneurship	• Prepare charts showing advantages of entrepreneurship over wages • Group discussions on role and features of entrepreneurship • Lectures/presentations by entrepreneurs on their experiences and success stories • Identify core skills of successful entrepreneur	06
	Total Duration in Hours			**15**

Unit 5: Green Skills – I				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (03 Hours)**	**10**
1.	Demonstrated the knowledge of the factors influencing natural resource conservation	• Introduction to environment, • Relationship between society and environment, ecosystem and factors causing imbalance • Natural resource conservation • Environment protection and conservation.	• Group discussion on hazards of deteriorating environment • Prepare posters showing environment conservation • Discussion on various factors that influence our environment	05
2.	Describe the importance of green economy and green skills	• Definition of green economy • Importance of green economy	• Discussion on the benefits of green skills and importance of green economy • Prepare a Poster showing the importance of green economy with the help of newspaper/magazine cuttings.	05
			Total Duration in Hours	**10**
	Total	**33**	**27**	**60**

GRADE IX, Part B: Vocational Skills

Unit No.	Unit Name				Duration in Hours
Unit 1	Fundamentals of Operating Systems and Computer Networks (60+60)				120
	Chapter	**Title of Chapter**	**Theory (hr)**	**Practical (hr)**	
	1	Introduction to Computer Networking	10	10	20
	2	OSI & TCP/IP Protocol Models	10	10	20
	3	IP Addressing & Subnetting	10	10	20
	4	TCP/IP Utilities & Troubleshooting	10	10	20
	5	Exploring Windows Operating System	10	10	20
	6	Exploring Linux Operating System	10	10	20

Unit 1: Fundamentals of Operating Systems and Computer Networks				
Ch. No	**Learning Outcome**	**Theory**	**Practical**	**120**
1.	Students will describe networking types, topologies, and devices; apply knowledge through simulated network setup and device identification.	• Definition and Need for Networking • History and evolution of Networking globally and in India • Client-Server concept • Types of Networks (LAN, MAN, WAN) • Network Topologies: Star, Ring, Bus, Mesh • Networking Devices: Hub, Switch, Router, Bridge • Transmission Media: Wired and Wireless	• Demonstration of Client-Server concept • Network topology simulation using tools like Cisco Packet Tracer • Identifying network devices and media through real/virtual labs	20
2.	Students will explain the OSI and TCP/IP models, and describe how protocols operate across layers in networking communication.	• IAB, ICNN, Internet, Intranet • OSI 7-layer Model: Functions and Layer Roles • TCP/IP 4-layer Model and Protocol Mapping • TCP vs UDP Protocols • Common Protocols (HTTP, FTP, DNS, SMTP, etc.)	• OSI vs TCP/IP model comparison exercises • Simulation of data packet flow across layers • Identification of physical, logical and port address	20

3.	Students will classify IP addresses, understand subnetting, and calculate subnet ranges and host limits using real-world scenarios.	• IPv4 Addressing Scheme, Classes (A, B, C) • Private vs Public IPs • Subnet Masks and CIDR Notation • Basics of Subnetting (Class C, B) • Introduction to IPV6 • Static and Dynamic IP	• IP address classification exercises • Subnetting practice with Class C and B examples • IP calculation tools and manual subnetting • Usage of whois.net and what is my IP-Portal	20
4.	Students will troubleshoot networks using command-line tools, understand protocol ports, and diagnose network connection issues effectively.	• TCP/IP Protocol Stack Overview • Port Numbers, Protocol Ports (HTTP-80, FTP-21, etc.) • Troubleshooting Tools: ping, ipconfig, tracert, netstat, nslookup	• Network diagnostics using command-line tools • Simulating and resolving IP conflicts • Port scanning demo with Nmap (safe environment)	20
5.	Students will install Windows OS, manage settings, and perform basic administrative and troubleshooting tasks using built-in Windows tools.	• Basics of Windows OS and Control Panel • Installing Windows OS (simulated) • User and Role Management • Remote Desktop and Task Manager	• Install Windows in virtual environment • Configure users, security settings, and manage basic admin tasks • Access system tools and control panel utilities	20
6.	Students will install Linux OS, execute terminal commands, and perform admin operations using secure command-line techniques.	• Linux OS Overview (Ubuntu/CentOS preferred) • File System Structure and Permissions • Installation of Linux OS • Basic Linux Commands and Sudo Usage	• Install Linux using virtual machines • Practice terminal commands: ls, cd, cp, chmod, sudo, etc. • Simulate admin tasks with root privileges	20

	• **Mini Projects:**
	  ○ Build a basic LAN topology simulation
	  ○ IP Subnetting Report with calculation tables
	  ○ OS installation walkthrough presentation (Windows or Linux)
	• **Quizzes & Oral Assessments**			

GRADE X, Part A: Employability Skills

Unit No.	Unit Name	Duration (Hrs.)
Unit 1	Communication Skills – II	15
Unit 2	Self-management Skills – II	10
Unit 3	Information and Communication Technology Skills – II	10
Unit 4	Entrepreneurial Skills – II	15
Unit 5	Green Skills – II	10
	Total Hours	**60**

Unit 1: Communication Skills – II				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (08 Hours)**	**15**
1.	Demonstrate knowledge of various methods of communication	• Methods of communication ○ Verbal ○ Non-verbal ○ Visual	• Writing pros and cons of written, verbal and non-verbal communication • Listing do's and don'ts for avoiding common body language mistakes	03
2.	Provide descriptive and specific feedback	• Communication cycle and importance of feedback • Meaning and importance of feedback • Descriptive feedback - written comments or conversations • Specific and non-specific feedback	• Constructing sentences for providing descriptive and specific feedback	03
3.	Apply measures to overcome barriers in communication	• Barriers to effective communication – types and factors • Measures to overcome barriers in effective communication	• Enlisting barriers to effective communication • Applying measures to overcome barriers in communication	03
4.	Apply principles of communication	• Principles of effective communication • 7 Cs of effective communication	• Constructing sentences that convey all facts required by the receiver • Expressing in a manner that shows respect to the receiver of the message • Exercises and games on applying 7Cs of effective communication	03

5.	Demonstrate basic writing skills	• Writing skills to the following:
		  ○ Sentence
		  ○ Phrase
		  ○ Kinds of Sentences
		  ○ Parts of Sentence
		  ○ Parts of Speech
		  ○ Articles
		• Construction of a Paragraph
			• Demonstration and practice of writing sentences and paragraphs on topics related to the subject	03

	Total Duration in Hours			**15**

Unit 2: Self-management Skills – II				
Sn	**Learning Outcome**	**Theory (05 Hours)**	**Practical (05 Hours)**	**10**
1.	Apply stress management techniques	• Meaning and importance of stress management • Stress management techniques – physical exercise, yoga, meditation • Enjoying, going to vacations and holidays with family and friends • Taking nature walks	• Exercises on stress management techniques – yoga, meditation, physical exercises • Preparing a write-up on an essay on experiences during a holiday trip	06
2.	Demonstrate the ability to work independently	• Importance of the ability to work independently • Describe the types of self-awareness • Describe the meaning of self-motivation and self-regulation	• Demonstration on working independently • goals • Planning of an activity • Executing tasks in a specific period, with no help or directives • Demonstration on the qualities required for working independently	04
	Total Duration in Hours			**10**

Unit 3: Information and Communication Technology Skills – II				
Sn	**Learning Outcome**	**Theory (04 Hours)**	**Practical (06 Hours)**	**10**
1.	Distinguish between different operating systems	• Classes of operating systems • Menu, icons and task bar on the desktop • File concept, file operations, file organization, directory structures, and file-system structures • Creating and managing files and folders	• Identification of task bar, icons, menu, etc. • Demonstration and practicing of creating, renaming and deleting files and folders, saving files in folders and sub-folders, restoring files and folders from recycle bin	06
2.	Apply basic skills for care and maintenance of computer	• Importance and need of care and maintenance of computer • Cleaning computer components • Preparing maintenance schedule • Protecting computer against viruses • Scanning and cleaning viruses and removing SPAM files, temporary files and folders	• Demonstration of the procedures to be followed for cleaning, care and maintenance of hardware and software	04
	Total Duration in Hours			**10**

Unit 4: Entrepreneurial Skills – II				
Sn	**Learning Outcome**	**Theory (06 Hours)**	**Practical (09 Hours)**	**15**
1.	List the characteristics of successful entrepreneur	• Entrepreneurship and society • Qualities and functions of an entrepreneur • Role and importance of an entrepreneur • Myth about entrepreneurship • Entrepreneurship as a career option	• Writing a note on entrepreneurship as career option • Collecting success stories of first generation and local entrepreneurs • Listing the entrepreneurial qualities – analysis of strength and weaknesses • Group discussion of self-qualities that students feel are needed to become successful entrepreneur • Collect information and related data for a business • Make a plan in team for setting up a business	15
	Total Duration in Hours			**15**

Unit 5: Green Skills – II				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (03 Hours)**	**10**
1.	Demonstrate the knowledge of importance, problems and solutions related to sustainable development	• Definition of sustainable development • Importance of sustainable development • Problems related to sustainable development	• Identify the problem related to sustainable development in the community • Group discussion on the importance of respecting and conserving indigenous knowledge and cultural heritage • Discussion on the responsibilities and benefits of environmental citizenship, including the conservation and protection of environmental values • Preparing models on rain water harvesting, drip / sprinkler irrigation, vermin-compost, solar energy, solar cooker, etc.,	10
	Total Duration in Hours			**10**

GRADE X, Part B: Vocational Skills

Unit No.	Unit Name				Duration in Hours
Unit 1	**Cyber Security**				**120**
	Chapter	**Title of Chapter**	**Theory (hr)**	**Practical (hr)**	
	1	Fundamentals of Cyber security	06	09	15
	2	Ethical Hacking & Cryptography	04	06	10
	3	Operating System Security	06	09	15
	4	Security Tools for Windows OS	04	06	10
	5	Wireless Networks & Security	06	09	15
	6	Mobile OS Security (Android & iOS)	04	06	10
	7	Web Applications & Browser Security	06	09	15
	8	Social Media & Security	04	06	10
	9	Digital Payments & Banking Fraud	06	04	10
	10	Cybercrime, Law & Helpline Systems	06	04	10

Unit 1: Cyber Security				
Ch No	**Learning Outcome**	**Theory**	**Practical**	**120**
1.	Students will describe cybersecurity principles, ethics, AAA model, and identify various threats, vulnerabilities, and information protection methods.	• Information Security Basics: CIA Triad (Confidentiality, Integrity, Availability) • Authentication, Authorization, and Accounting (AAA) • Threats and vulnerabilities • Ethical and Unethical Behavior	• Demonstration of CIA using file permissions • Simulated login authentication setup • Case studies on cyber ethics	15
2	Students will explore ethical hacking, malware types, and describe encryption, decryption, and basic cryptographic techniques including hashing algorithms.	• Introduction to Ethical Hacking • Malware types and prevention • Cryptography Basics: Plaintext, Ciphertext, Encryption, Decryption, Symmetric & Asymmetric Encryption, Hashing	• Demonstration of encryption and description using offline and online • Hash generation using tools like HashCalc • Demonstration of simple Caesar and Vigenère ciphers • Simulated malware sandbox observation	10
3	Students will learn OS-level security features, user access control, password policies, and file sharing and protection mechanisms.	• OS Security: Access Control, User Account Policies • File Sharing Permissions, Password Policies	• User account creation & management (Windows/Linux) • Set file/folder permissions and analyze logs • Simulate brute force attack detection	15

4	Students will configure antivirus tools, firewall settings, and describe virus protection, network defense, and rule-based security enforcement.	• Antivirus and Threat Protection • Firewall and Network Protection • Inbound/Outbound Rule Configuration	• Configuring Windows Defender • Setting up firewall rules • Use of tools like Wireshark and Netstat	10
5	Students will describe wireless technologies, Wi-Fi encryption standards, and simulate common wireless attacks and secure connection practices.	• Wireless Network Basics (Wi-Fi) • WPA, WPA2, WPA3 Security • Wi-Fi Sniffing & MITM (Man-in-the-Middle) Attacks	• Demonstration of various types of wireless network (simulation/video) • Simulate open vs secured Wi-Fi scenarios • Network scanning with tools like Fing • WPS security test simulations	15
6	Students will analyze mobile operating systems, evaluate app permissions, and describe security risks and protection on Android and iOS.	• Android vs iOS Architecture • App Permissions & Risks • Threats to Mobile Platforms (Spyware, Phishing)	• Demonstration of Android/iOS environment • Install and analyze apps with risky permissions • Simulate mobile malware behaviors • Use of mobile security apps (e.g., Norton Mobile)	10
7	Students will describe web app structure, secure browsing protocols, and identify browser vulnerabilities and safe online behaviors.	• Web App Components & Protocols (HTTP, HTTPS, SSL/TLS) • Secure Browsing Practices • Cookie and Session Management	• Demonstration of Browser security setting (video/ simulator) • Demonstration MITM and session hijacking • Use browser developer tools to inspect cookies and headers • Explore HTTPS using SSL Labs	15
8	Students will explore privacy settings, recognize online scams, and apply protective measures on various social media platforms.	• Social Media Privacy Settings • Phishing, Impersonation, Scams • Reporting and Blocking Threats	• Configuring privacy settings on Facebook/Instagram • Identifying phishing DMs or emails • Fake profile detection demo	10

9	Students will describe digital transactions, secure payment methods, and identify different types of banking fraud and their prevention.	• Digital Payment Methods: UPI, Wallets, Cards • Two-Factor Authentication, QR Code Security • Banking Fraud: SIM Swap, OTP Phishing	• Secure transactions demo (simulated) • Case study of a payment fraud and its detection • Exploring payment gateway interfaces	10
10	Students will learn cyber law basics, identify cybercrimes, and describe the complaint filing procedures and helpline systems for support.	• Types of Cybercrimes (Hacking, Cyberbullying, Identity Theft) • Cyber Laws in India (IT Act 2000 overview) • Role of Cyber Cell, How to File Complaints	• Schedule and visit to the nearest cyber cell • Simulate mock cybercrime complaint filing • Use cybercrime helpline portal demo • Create awareness through digital poster using Canva/Adobe express etc. platform for cyber laws and cyber crime	10
	• **Projects (Lab-Based):** ○ Create a secure Wi-Fi configuration setup ○ Browser security audit report ○ Social media security awareness campaign • **Quizzes & Theory Tests**			

6. ORGANISATION OF FIELD VISITS and OJT

Field visits and On-the-Job Training (OJT) provide essential practical exposure for students pursuing a Cyber Security Assistant role. These initiatives bridge the gap between theoretical knowledge and real-world application, equipping students with hands-on skills in cyber security tools, techniques, and industry best practices. Annually, at least three field visits and a 4-6 week OJT program during vacations are planned to immerse students in real-time workplace scenarios.

Field Visits:

- Visits to Cyber Security Operation Centers (CSOCs), IT service providers, and data centers.
- Exposure to infrastructure, tools, and real-time threat monitoring processes.

On-the-Job Training (OJT):

- Practical tasks in vulnerability assessment, incident response, and network security monitoring.
- Hands-on experience with firewalls, endpoint protection, and compliance frameworks.

Learning Outcomes:

- Proficiency in using tools, documentation, and reference materials.
- Ability to diagnose and resolve security, network, and hardware issues.
- Development of communication, teamwork, and ethical practices in the workplace.

Health and Safety: Emphasis on workplace safety protocols and responsible e-waste disposal. This structured approach ensures that students gain industry-relevant skills, confidence in tackling security challenges, and preparedness for professional certifications.

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.

• Whiteboard and Markers • Chart paper and sketch pens • LCD Projector and Laptop for presentations	• PCs/Laptops • 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 • Kali Linux / Ubuntu, Windows 10/11, VirtualBox / VMware, Wireshark, Nmap, Metasploit, Nessus / OpenVAS • NIST Cybersecurity Framework, CEH / Security+ guides
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

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