LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE:
Domestic Biometric Data Operator
(QUALIFICATION PACK: Ref. Id. SSC/Q2213)
SECTOR: IT-ITeS

Classes 11 and 12

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal – 462 002, M.P., India
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Joint Director
PSS Central Institute of Vocational Education, NCERT, Shyamla Hills, Bhopal

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 Human Resource Development, 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 **Domestic Biometric Data Operator**. 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.

Hrushikesh Senapaty
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 fulfil the growing aspirations of our youth and the demand of skilled human resource, the Ministry of Human Resource Development (MHRD), 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 fulfil the needs of the society and the world of work. In order to honour 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 courseware 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 MHRD and NCERT for the financial support and cooperation in realising the objective of providing learning outcome based modular curricula and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Rashtriya Madhyamik Shiskha Abhiyan* (RMSA) of MHRD.

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 courseware. We hope that this document will prove useful in turning out more competent Indian workforce for the 21st Century.

RAJESH P. KHAMBAYAT
Joint Director
PSS Central Institute of Vocational Education

ACKNOWLEDGEMENT

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* Rashtriya Madhyamik Shiksha Abhiyan (RMSA) and the officials of the Ministry of Human Resource Development (MHRD), Government of India for the financial support to the project for development of curricula.

We are grateful to the Director, NCERT for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of RMSA, MHRD, RMSA Cell at the National Council of Educational Research and Training (NCERT), National Skill Development Agency (NSDA) and National Skill Development Corporation (NSDC) and IT-ITeS Sector Skill Council of Indian (NASCOM) for their academic support and cooperation.

We are grateful to the expert contributors and Dipak D. Shudhalwar, Associate 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), Vipin Kumar Jain, Associate Professor and Head, Programme Planning and Monitoring Cell (PPMC) and Dipak Shudhalwar, Associate Professor (CSE) and Head, Computer Centre, PSSCIVE in development of the curriculum for the employability skills are duly acknowledged.

We are also grateful to the Course Coordinator Dipak D. Shudhalwar, Associate Professor (CSE), Head, Department of Engineering and Technology, PSSCIVE, for bringing out this curriculum in the final form.

PSSCIVE Team

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1. COURSE OVERVIEW

COURSE TITLE: Domestic Biometric Data Operator

Domestic Biometric Data Operator in the IT-ITeS Industry is also known as Biometric Technician and Biometric Coordinator. Individuals at this job are mainly responsible for the smooth running of biometric data capture and ensuring users get maximum benefits from them. Individual tasks vary depending on the size and structure of the organization, but may include installing and configuring computer hardware operating systems and applications; monitoring and maintaining computer systems and networks, troubleshooting biometric system and network problems and diagnosing and solving hardware/software faults etc.

This job requires the individual to have thorough knowledge of various technology trends and processes as well as have updated knowledge about biometric systems and IT initiatives. The individual should have fast and accurate typing / data encoding. He / She should be comfortable with latest

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

- ✓ Apply effective oral and written communication skills to interact with people and 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 and abilities;
- ✓ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ✓ Undertake bio-metric data entry and processing;
- ✓ Manage the work to meet requirements;
- ✓ Maintain a healthy, safe and secure working environment

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

COURSE LEVEL: This course can be taken up at Intermediate level in Class 11 and Class 12.

COURSE DURATION: **Total : 600 hrs**

Class 11 : 300 hrs
Class 12 : 300 hrs

Total: 600 hrs

2. SCHEME OF UNITS AND ASSESSMENT

This course is a planned sequence of instructions consisting of Units meant for developing employability and vocational competencies of students of Class 11 and 12 opting for vocational subject along with general education subjects. The unit-wise distribution of hours and marks for Class 11 is as follows:

CLASS 11			
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory and Practical 100**
Part A	**Employability Skills**		
	Communication Skills – III	25	**10**
	Self-management Skills – III	25	
	Basic ICT Skills – III	20	
	Entrepreneurial Skills – III	25	
	Green Skills – III	15	
	Total	**110**	**10**
Part B	**Vocational Skills**		
	Unit 1: Fundamentals of Data	35	**40**
	Unit 2: Procedures and tools for biometric data	60	
	Unit 3: Operating system and system maintenance	30	
	Unit 4: Basics of Internet and Standards of Bio-metric Data	40	
	Total	**165**	**40**
Part C	**Practical Work**		
	Practical Examination	6	15
	Written Test	1	10
	Viva Voce	3	10
	Total	**10**	**35**
Part D	**Project Work/Field Visit**		
	Practical File/ Student Portfolio	10	10
	Viva Voce	5	5
	Total	**15**	**15**
	Total	**300**	**100**

The unit-wise distribution of hours and marks for **Class 12** is as follows:

CLASS 12			
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory and Practical 100**
Part A	**Employability Skills**		
	Communication Skills – IV	25	**10**
	Self-management Skills – IV	25	
	Basic ICT Skills – IV	20	
	Entrepreneurial Skills – IV	25	
	Green Skills – IV	15	
	Total	**110**	**10**
Part B	**Vocational Skills**		
	Unit 1: Applications of Bio-metric Data	40	**40**
	Unit 2: Fundamentals of Database Systems	45	
	Unit 3: Advanced Technologies	40	
	Unit 4: Health and Safety Measures	40	
	Total	**165**	**40**
Part C	**Practical Work**		
	Practical Examination	6	15
	Written Test	1	10
	Viva Voce	3	10
	Total	**10**	**35**
Part D	**Project Work/Field Visit**		
	Practical File/ Student Portfolio	10	10
	Viva Voce	5	5
	Total	**15**	**15**
	Total	**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: 40**

		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 Ques.)**

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

CLASS 11

Part A: Employability Skills

Sn	Units	Duration in Hours
1.	Unit 1: Communication Skills – III	25
2.	Unit 2: Self-management Skills – III	25
3.	Unit 3: Basic ICT Skills – III	20
4.	Unit 4: Entrepreneurial Skills – III	25
5.	Unit 5: Green Skills – III	15
	Total	**110**

Unit 1: Communication Skills – III				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25 Hrs**
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	05
2.	Identify specific communication styles	• Communication styles- assertive, aggressive, passive-aggressive, submissive, etc.	• Observing and sharing communication styles of friends, teachers and family members and adapting the best practices • Role plays on communication styles.	10
3.	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	10
			Total Duration in Hours	**25**

Unit 2: Self-management Skills – III				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25 Hrs**
1.	Demonstrate impressive	• Describe the importance of dressing appropriately, looking	• Demonstration of impressive appearance and groomed	07

	appearance and grooming	decent and positive body language. • Describe the term grooming • Prepare a personal grooming checklist. • Describe the techniques of self-exploration.	personality. • Demonstration of the ability to self- explore.	
2.	Demonstrate team work skills	• Describe the important factors that influence in team building. • Describe factors influencing team work.	• Group discussion on qualities of a good team. • Group discussion on strategies that are adopted for team building and team work.	08
3.	Apply time management strategies and techniques	• Meaning and importance of time management – setting and prioritizing goals, creating a schedule, making lists of tasks, balancing work and leisure, using different optimization tools to break large tasks into smaller tasks.	• Game on time management. • Checklist preparation. • To-do-list preparation.	10
			Total Duration in Hours	**25**

Unit 3: Basic ICT Skills – III				
Sn	**Learning Outcome**	**Theory (08 Hours)**	**Practical (12 Hours)**	**20 Hrs**
1.	Create a document on word processor	• Introduction to word processing. • Software packages for word processing. • Opening and exiting the word processor. • Creating a document	• Demonstration and practice of the following: • Listing the features of word processing, • Listing the software packages for word processing, • Opening and exit the word processor, • Creating a document	10
2.	Edit, save and print a document in word processor	• Editing text • Wrapping and aligning the text • Font size, type and face. • Header and Footer • Auto correct • Numbering and bullet • Creating table • Find and replace • Page numbering. • Printing document. • Saving a document in various formats	• Demonstration and practicing the following: • Editing the text • Word wrapping and alignment, • Changing font type, size and face, • Inserting header and footer, • Removing header and footer, • Using autocorrect option, • Insert page numbers and bullet, • Save and print a document.	10
			Total Duration in Hours	**20**

Unit 4: Entrepreneurial Skills – III				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25 Hrs**
1.	Describe the significance of entrepreneurial values and attitude.	• Values in general and entrepreneurial values. Entrepreneurial value orientation with respect to inattentiveness, independence, outstanding performance and respect for work.	• Listing of entrepreneurial values by the students. • Group work on identification of entrepreneurial values and their roles after listing or reading 2-3 stories of successful entrepreneur. • Exhibiting entrepreneurial values in Ice breaking, rapport building, group work and home assignments.	10
2.	Demonstrate the knowledge of attitudinal changes required to become an entrepreneur.	• Attitudes in general and entrepreneurial attitudes • Using imagination/ intuition • Tendency to take moderate risk • Enjoying freedom of expression and action • Looking for economic opportunities • Believing that we can change the environment • Analyzing situation and planning action • Involving in activity	• Preparing a list of factors that influence attitude in general and entrepreneurial attitude. • Demonstrating and identifying own entrepreneurial attitudes during the following micro lab activities like thematic appreciation test. • Preparing a short write-up on "who am I". • Take up a product and suggest how its features can be improved. • Group activity for suggesting brand names, names of enterprises, etc.	15
			Total Duration in Hours	**25**

Unit 5: Green Skills – III				
Sn	**Learning Outcome**	**Theory (07 Hours)**	**Practical (08 Hours)**	**15 Hrs**
1.	Describe importance of main sector of green economy	• Main sectors of green economy- E-waste management, green transportation, renewal energy,green construction, water management. • Policy initiatives for greening economy in India.	• Preparing a poster on any one of the sectors of green economy. • Writing a two-page essay on important initiatives taken in India for promoting green economy.	08
2.	Describe the major green Sectors/ Areas and the role of various stakeholder in green economy	• Stakeholders in green economy. • Role of government and private agencies in greening cities, buildings, tourism, industry, transport, renewable energy, waste management,	• Preparing posters on green Sectors/Areas: cities, buildings, tourism, industry, transport, renewable energy, waste management, agriculture, water, forests and fisheries.	07

		agriculture, water, forests and fisheries.		
			Total Duration in Hours	**15**

Part B: Vocational Skills

Class XI

Sn	Units	Duration in Hours
1.	Unit 1: Fundamentals of Data	35
2.	Unit 2: Procedures and tools for biometric data	60
3.	Unit 3: Operating system and system maintenance	30
4.	Unit 4: Basics of Internet and Standards of Bio-metric Data	40
	Total Duration	**165**

Unit 1: Fundamentals of Data				
Sn	**Learning Outcome**	**Theory (15 Hours)**	**Practical (20 Hours)**	**35 Hrs**
1.	Appreciate the concept of data, types and formats	• Introduction to data (what is data) • Real life examples of data, • Types of data – quantitative data, qualitative data, • Data formats, • Electronic data – concept of OTP.	• Prepare your biodata and identify different types of data in biodata information, • Prepare a list of qualitative data such as picture, photogrph, sound, music, video, • List the applications requiring qualitative data, • Prepare a list of quantitative data such as marks of subject, pin code, bank account number, mobile number, • List the applications requiring quantitative data, • Observe the requirement of OTP in online applications, • List the applications requiring OTP.	10
2.	Appreciate the the uniqueness of biometric data	• Demographic data, • Biometric data – thumb/ fingerprint data, palm data, eyes/ iris data, face data, • Types of biometric data – physiological/ behavioral data, • Qualities of biometric data, • Limitations of biometric data, • Domestic and non-domestic (local/global) data.	• Identify and list the difference between individual and demographic data, • Observe uniqueness in the individual human beings based on thumb, face and iris, • Identify and list the difference between domestic and non-domestic data.	10
3.	Collect and	• Importance of data collection,	• Demonstrate to collect data in	07

	digitize the data	• Advantages of data collection, • Applications of data collection in real life, • Handwritten data and digital data, • Digitization of handwritten data	real life applications such as information of employees, • Differentiate between the handwritten and digital data, • Observe and record the process to digitize the handwritten data.	
4.	Store and handle data securely	• Storing and handling of data, • Procedure for storing and handing of data, • Devices used for storing and handing of data, • Data security	• Illustrate the steps for storing the data, • List the precautions to be taken for handling of data, • Identify and list devices used for storing and handling of data. • Illustrate the importance of data security through some real life examples of data loss.	08
			Total Duration in Hours	**35**

Unit 2: Procedures and tools for Biometric data				
Sn	**Learning Outcome**	**Theory (30 Hours)**	**Practical (30 Hours)**	**60 Hrs**
1.	Understand the power of computing	• Introduction to computer, • Computers, types of computers, desktop, laptops, tablet, mobile, • Concept of memory, • Types of memory, • Memory units, • Different types of printer, • Storage devices – CD, DVD, USN Flash drive, portable HDD, • USB Hub • GPS dongle • UPS, Electrical generator	• Prepare a diagram and mark the various parts of computer system, • List the various types of computers commonly used in real life, • List the unit for memory and the size of memory used in different computing devices, • Identify and name the various storage devices, • Identify the location and connect devices to the USB Hub, • Illustrate the use of UPS, Electrical generator in case of power failure.	10
2.	Familiarize with biometric devices	• History of biometric devices, • Introduction to scanners, • Types of scanner, • Specifications and configuration of scanners, • Introduction to digital camera, • Types of camera, • Concept of resolution, • Other I/O devices in biometric data collection – slap scanner, iris scanner/capture device, • Punching machine or Biometric	• Identify and prepare a diagram of scanner or digitizer and name its various parts, • Observe the process of scanning, • List the specifications and configuration of scanner, • Identify and prepare a diagram of digital camera and name its various parts, • Observe the process of capturing thumb/ finger, palm,	10

		Attendance Machine.	face and iris image, • List the specifications and configuration of digital camera, slap scanner, iris scanner/capture device,	
3.	Set up biometric devices	• Introduction to biometric devices, • Configuration and specification of biometric devices, • Setting up of various components of biometric system, • Testing of biometric system, • Software required for biometric system – client side and server side software.	• Sketch the diagram of complete biometric system and name each part, • List the specifications and configuration of biometric system, • Set up various components of biometric system, • Test the functioning of biometric devices, • Identify the client side and server side software.	15
4.	Capture biometric data	• Procedure for collecting biometic data, • Registration procedure, • Various forms required – registration form and data updation form • Scanning procedure of face, thumb or palm, iris • Data validation, • Errors and error handling process, • Biometric data exceptions, • Data uploading, • Duplication of records, • Printing of data, • Prototype examples of biometric data.	• Observe and list the steps and procedure for collecting biometric data, • Fill in the biometric registration form, • Update the existing biometric data as per the requirement, • List the various forms required for biometric process, • Demonstrate the process of scanning of face, thumb or palm, iris, • Check for data correction, • Observe the types of data errors and take the remedy measures to solve it, • Demonstrate to upload biometric data on server, • Demonstrate to print the required fields of biometric data • Demonstrate the biometric data of any individual case.	15
5.	Interfacing of biometric devices	• Interfacing of various units in data collection, • Concept of interfacing, • Connection diagram, • Actual photographs of interfacing.	• Draw the connection diagram of interfacing of various units. • Demonstrate the interfacing or connection of various units in data collection.	10
			Total Duration in Hours	**60**

Unit 3: Operating System and System Maintenance				
Sn	**Learning Outcome**	**Theory (12 Hours)**	**Practical (18 Hours)**	**30 Hrs**
1.	Work with operating system	• Concept of operating system, • Concept of embedded system, • Tasks/ jobs performed by the operating system, • Types of operating system, • Operating system used for biometric data collection, • System commands commonly required for performing tasks,	• List the names of operating system used in biometric system, • Demonstrate to install given desktop operating system, • List the tasks and their corresponding commands of operating system, • Execute the commands of operating system to perform specific task.	10
2.	Maintain the biometric system	• Concept of system maintenance, • Introduction to virus, antivirus and malware software, • Procedure for regular maintenance of the system, • Concept of backup of data, • Procedure for back of data.	• Undertake the maintenance of biometric system, • Install and use the antivirus software, • Demonstrate the procedure for regular maintenance of the system, • Take the backup of data of biometric system.	10
3.	Update the biometric system	• Concept of updation of system, • Concept of licensed/ freeware operating systems, • Real life examples of freeware operating systems, • Appropriate screenshots of freeware operating system.	• Check regularly for updation of the biometric system, • List the use of licensed and freeware operating system, • Demonstrate the use of licensed/freeware operating systems.	10
			Total Duration in Hours	**30**

Unit 4: Basics of Internet and Standards of Bio-metric Data				
Sn	**Learning Outcome**	**Theory (20 Hours)**	**Practical (20 Hours)**	**40 Hrs**
1.	Appreciate the network environment	• Basic concepts of networking, • Types of network, • Network devices, • Network protocols, • Concept of client and server.	• Draw the diagrams of different types of network, • Demonstrate the connection and installation of network devices, • Use the computer in network environment, • Draw logical diagram of client and server.	10
2.	Use Internet	• Introduction to Internet and Intranet • logical diagram of internet, • concept of world wide web,	• Draw logical diagram of Internet and Intranet • Demonstrate opening, accessing and closing of	10

		• concept of websites, • Introduction to web browsers, • Different web browsers – IE, Google Chrome, Apple Safari, Firefox.	different websites on different web browsers.	
3.	Understand national and international standards of data	• Introduction to standard digital codes, • ascii code, ebcdic code, unicode, • Indian govermnent standards of biometric data, • International standards of biometric data, • Quality factor and quality procedures, • Linkages and usages biometrc data,	• Identify and list standard digital codes, • Give prototype examples of conversion of real life data into digital data, • List Indian govermnent standards of biometric data, • International standards of biometric data, • Determine the quality of biometric data, • List organisations for which the biometric data is shared such as income tax department and banks.	10
4.	Observe the IT practices	• Concept of log files and uses of log files in data access determination, • Concept of data audit • IT Act of India (current 2016) • IT work ethics	• Retrieve the log files and obtain useful information regarding data access. • List wrong and right practices, • List features of IT act of India, • Perform the data audit for the given database.	10
			Total Duration in Hours	**40**

CLASS 12

Part A: Employability Skills

S. No.	Units	Duration in Hours
1.	Unit 1: Communication Skills – IV	25
2.	Unit 2: Self-management Skills – IV	25
3.	Unit 3: Basic ICT Skills – IV	20
4.	Unit 4: Entrepreneurial Skills – IV	25
5.	Unit 5: Green Skills – IV	15
	Total	**110**

Unit 1: Communication Skills – IV				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25 Hrs**
1.	Describe the steps to active listening skills	• Importance of active listening at workplace • Steps to active listening.	• Demonstration of the key aspects of becoming active listener. • Preparing posters of steps for active listening.	10
2.	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.	15
			Total Duration in Hours	**25**

Unit 2: Self-management Skills – IV				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25 Hrs**
1.	Describe the various factors influencing self-motivation	• Finding and listing motives (needs and desires); • Finding sources of motivation and inspiration (music, books, activities); expansive thoughts; living fully in the present moment; dreaming big.	• Group discussion on identifying needs and desire. • Discussion on sources of motivation and inspiration.	10
2.	Describe the basic personality traits, types and disorders	• Describe the meaning of personality. • Describe how personality influence others. • Describe basic personality traits.	• Demonstrate the knowledge of different personality types.	

		• Describe common personality disorders- paranoid, antisocial, schizoid, borderline, narcissistic, avoidant, dependent and obsessive.		15
			Total Duration in Hours	**25**

Unit 3: Basic ICT Skills – IV				
Sn	**Learning Outcome**	**Theory (06 Hours)**	**Practical (14 Hours)**	**20 Hrs**
1.	Perform tabulation using spreadsheet application	• Introduction to spreadsheet application, • Spreadsheet applications, • Creating a new worksheet, • Opening workbook and entering text, • Resizing fonts and styles, • Copying and moving, • Filter and sorting, • Formulas and functions, • Password protection, • Printing a spreadsheet, • Saving a spreadsheet in various formats.	• Demonstration and practice on the following: • Introduction to the spreadsheet application, • Listing the spreadsheet applications, • Creating a new worksheet, • Opening the workbook and enter text, • Resizing fonts and styles, • Copying and move the cell data, • Sorting and Filter the data, • Applying elementary formulas and functions, • Protecting the spreadsheet with password, • Printing a spreadsheet, • Saving the spreadsheet in various formats.	10
2.	Prepare presentation using presentation application	• Introduction to presentation, • Software packages for presentation, • Creating a new presentation, • Adding a slide, • Deleting a slide, • Entering and editing text, • Formatting text, • Inserting clipart and images, • Slide layout, • Saving a presentation, • Printing a presentation document.	• Demonstration and practice on the following: • Listing the software packages for presentation, • Explaining the features of presentation, • Creating a new presentation, • Adding a slide to presentation, • Deleting a slide, • Entering and edit text, • Formatting text, • Inserting clipart and images, • Sliding layout, • Saving a presentation, • Printing a presentation document.	10
			Total Duration in Hours	**20**

Unit 4: Entrepreneurial Skills – IV				
Sn	**Learning Outcome**	**Theory (10 Hours)**	**Practical (15 Hours)**	**25 Hrs**
1.	Identify the general and entrepreneurial behavioral competencies	• Barriers to becoming entrepreneur. • Behavioral and entrepreneurial competencies – adaptability/decisiveness, initiative/perseverance, interpersonal skills, organizational skills, stress management, valuing service and diversity.	• Administering self-rating questionnaire and score responses on each of the competencies. • Collect small story/ anecdote of prominent successful entrepreneurs. • Identify entrepreneurial competencies reflected in each story and connect it to the definition of behavioral competencies. • Preparation of competency profile of students.	10
2.	Demonstrate the knowledge of self-assessment of behavioral competencies	• Entrepreneurial competency in particular: self-confidence, initiative, seeing and acting on opportunities, concern for quality, goal setting and risk taking, problem solving and creativity, systematic planning and efficiency, information seeking, persistence, influencing and negotiating, team building.	• Games and exercises on changing entrepreneurial behavior and development of competencies for enhancing self-confidence, problem solving, goal setting, information seeking, team building and creativity.	15
			Total Duration in Hours	**25**

Unit 5: Green Skills – IV				
Sn	**Learning Outcome**	**Theory (05 Hours)**	**Practical (10 Hours)**	**15 Hrs**
1.	Identify the role and importance of green jobs in different sectors	• Role of green jobs in toxin-free homes. • Green organic gardening, public transport and energy conservation, • Green jobs in water conservation. • Green jobs in solar and wind power, waste reduction, reuse and recycling of wastes, • Green jobs in green tourism • Green jobs in building and construction. • Green jobs in appropriate technology. • Role of green jobs in Improving energy and raw materials use	• Listing of green jobs and preparation of posters on green job profiles. • Prepare posters on green jobs.	15

		• Role of green jobs in limiting greenhouse gas emissions • Role of green jobs minimizing waste and pollution • Role of green jobs in protecting and restoring ecosystems • Role of green jobs in support adaptation to the effects of climate change		
			Total Duration in Hours	**15**

Class XII, Part B: Vocational Skills

Sn	Units	Duration in Hours
1.	Unit 1: Applications of Bio-metric Data	40
2.	Unit 2: Fundamentals of Database Systems	45
3.	Unit 3: Advanced Technologies	40
4.	Unit 4: Health and Safety Measures	40
	Total Duration	**165**

Unit 1: Applications of Bio-metric Data				
Sn	**Learning Outcome**	**Theory (20 Hours)**	**Practical (20 Hours)**	**40 Hrs**
1.	Report attendance using Biometric Attendance System (BAS)	• Illustration of use of biometric data in real life, • Setup the BAS in organisation, • Procedure for creation of database of employees in organisation, • Checking of data and correcting the data for possible errors, • Generating reports of BAS, • Maintenance of the BAS,	• List real life situations where biometric data is used • List the the data items required in the preparation of BAS, • Demonstrate the procedure of preparation of BAS, • Draw the setup diagram of various devices in preparation of BAS, • Generate various types of reports such as daily report, monthly report, • Demonstrate the maintenance procedure of biometric system for preparation of aadhar card.	08
2.	Prepare aadhar card	• Biometric data in preparation of aadhar card, • procedure of preparation of aadhar card, • Setup required in preparation of aadhar card, • actual photographs of preparation of aadhar card, • Actual screenshots in the various stages of preparation of	• List the the data items required in the preparation of aadhar card • Demonstrate the procedure of preparation of aadhar card • Draw the setup diagram of various devices in preparation of aadhar card • Demonstrate the maintenance procedure of biometric system	08

		aadhar card, • Maintenance of the system in preparation of aadhar card,	for preparation of aadhar card.	
3.	Prepare passport	• Biometric data in preparation of passport, • Procedure of preparation of passport, • Setup required in preparation of passport, • Actual photographs of preparation of passport, • Actual screenshots in the various stages of preparation of passport, • Maintenance of the system in preparation of passport,	• List the the data items required in the preparation of passport • Demonstrate the procedure of preparation of passport • Draw the setup diagram of various devices in preparation of passport • Demonstrate the maintenance procedure of biometric system for preparation of passport.	08
4.	Prepare driving license	• Biometric data in preparation of driving licence, • Procedure of preparation of driving licence, • Setup required in preparation of driving licence, • Actual photographs of preparation of driving licence, • Actual screenshots in the various stages of preparation of driving licence, • Maintenance of the system in preparation of driving licence,	• List the the data items required in the preparation of driving license • Demonstrate the procedure of preparation of driving license • Draw the setup diagram of various devices in preparation of driving license • Demonstrate the maintenance procedure of biometric system for preparation of driving license.	08
5.	Prepare college/ school/ office ID	• Biometric data in preparation of college/ school/ office ID, • Procedure of preparation of college/ school/ office ID, • Setup required in preparation of college/ school/ office ID, • Actual photographs of preparation of college/ school/ office ID, • Actual screenshots in the various stages of preparation of college/ school/ office ID, • Maintenance of the system in preparation of college/ school/ office ID.	• List the the data items required in the preparation of college/ school/ office ID • Demonstrate the procedure of preparation of college/ school/ office ID • Draw the setup diagram of various devices in preparation of college/ school/ office ID • Demonstrate the maintenance procedure of biometric system for preparation of college/ school/ office ID.	08
			Total Duration in Hours	**40**

Unit 2: Fundamentals of Database Systems				
Sn	**Learning Outcome**	**Theory (20 Hours)**	**Practical (25 Hours)**	**45 Hrs**
1.	Appreciate the	• Concept of database systems,	• List the requirement of	10

	use of database systems,	• Relational database systems, • Examples of database systems.	database system for handling of large data • List the various database systems available for database management.	
2.	Create and update database	• Creation and updation of database using SQL (MySQL), • Commands for creation of database, • Commands for updataion of database, • Practical examples and appropriate screen shots.	• List the steps for creation of simple database consisting of 5 fields, • Collect and enter appropriate data in the database. • List the steps for updating the already created database.	11
3.	Query a database	• Querying a database, • Concept of query, • Commands for querying a data, • Practical examples and appropriate screen shots, • Special database tools for handling biometric data.	• List the steps processing a simple query such as to find the availability of data in the database • Construct a query to search a given name in the database.	12
4.	Secure the data in database	• Data security, • Concept of security, • Importance of data security, • Possible threats for data corruption, • Security procedure. • Practical examples of threats to data in database, • Data encryption and data decryption.	• Identify and list the possible threats to the data in database, • Identify the security procedures for avoiding damages to the data, • Identify the procedure to deal with damaged data, • Demonstrate to recover the given damaged data.	12
			Total Duration in Hours	**45**

Unit 3: Advanced Technologies				
Sn	**Learning Outcome**	**Theory (20 Hours)**	**Practical (20 Hours)**	**40 Hrs**
1.	Appreciate the concept of cloud computing	• Cloud computing, • Concept of cloud, • Coud services in relation with biometric data services, • Services offered by NIC, Google and Apple, • Advanced networking technologies, • Concept of data mart and data warehouse.	• List the various commercial platform available for cloud services • Demonstrate to use of cloud services for storing of data on commercial platform • Demonstrate uploading and downloading the data using network technologies	10
2.	Appreciate face recognition and palm recognition	• Advanced biometric technologies, • Introduction to face recognition,	• List out the the use of face recognition in real life events (such as unlocking of mobile) • List the challenges in face	10

		• Technology used in face recognition, • Challenges in face recognition, • Introduction to palm recognition, • Technology used in palm recognition, • Challenges in palm recognition.	recognition • List out the the use of palm recognition in real life events (such as Biometric Attendance System) • List the challenges in palm recognition	
3.	Appreciate thumb/ finger recognition and character recognition	• Introduction to thumb/ finger recognition, • Technology used in thumb/ finger recognition, • Challenges in thumb/ finger recognition, • Introduction to character/ signature recognition, • Technology used in character/ signature recognition, • Challenges in character/ signature recognition.	• List out the the use of thumb/ finger recognition in real life events (such as unlocking of mobile, BAS) • List the challenges in thumb/ finger recognition • List out the the use of character/ signature recognition in real life events (such as Conversion of image data into text System) • List the challenges in character/ signature recognition.	10
4.	Use of digital signature and scripting technology	• Concept of digital signature, • Digital signature dongles, • Using advanced scripting technology enabled interactive webpages, • Internet of Things (IoT) devices.	• List the use of digital signature in authentication of digital documentation (Aadhar, PAN) • Visit the different interactive webpages that uses scripting technology(Aadhar web site-downloading aadhar card)	10
			Total Duration in Hours	**40**

Unit 4: Health and Safety Measures				
Sn	**Learning Outcome**	**Theory (20 Hours)**	**Practical (20 Hours)**	**40 Hrs**
1.	Appreciate the importance of health, safety and security at work place	• Introduction to health, safety and security at work place, • Policies and procedures for health, safety and security, • Government agencies and their role in safety and security.	• List the importance of health, safety and security at work place • Prepare safety and security policies(Prototype) • List the names of govt agencies that monitor safety and security at work place	08
2.	Check air and water quality at workplace	• Air and water quality monitoring process, • Guidelines for clean air and clean water.	• Prepare steps for checking of air and water quality at workplace • Prepare ideal guideline for clean air and clean water at work place(such as vehicle free campus)	08

3.	Practice computer ergonomics	• Importance of cleanliness at work station, • Guidelines for using of desk, chairs, computers, monitor, keyboard at workplace, • Objectives and goals of computer ergonomics, • Importance of body positions, light conditions and work habits	• Give the steps to maintain the cleanliness at work place • Prepare ideal guideline for using of desk, chairs, computers, monitor, keyboard at workplace • Identify the health problems because of wrong work habits and bad light conditions	08
4.	Protect against breaches in health, safety and security	• Different types of breaches in health, safety and security, • procedure for reporting the breaches in health, safety and security, • Evacuation procedures for workers and visitors	• List possible situations that causes breaches in health, safety and security • Prepare evacuation procedure for workers in case of emergencies such as fire, Flood,or any disaster	08
5.	Deal with the emergency services	• Medical assistance and the emergency services, • Display of phone numbers and addresses for medical assistance and emergency services, • Policy for medical assistance at work place.	• Prepare list of items to be kept in first aid box • Prepare the list of medical practitioners along with their phone number in the near by region • List ideal policy for medical assistance at work place	08
			Total Duration in Hours	**40**

6. ORGANISATION OF FIELD VISITS and OJT

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace. During summer or winter vacation, students can undergo one week on-the-job training in nearby industry or work place.

Visit a Data Centre of Aadhar Card preparation and visit the organisation implementing Biometric Attendance System (BAS), and observe the following: Location, Site, Computer systems and peripheral devices, Biometric System and devices. During the visit, students should obtain the following information from the organisation:

1. Computer System, parts and peripherals.
2. Specifications of various parts of computer system.
3. Biometric System and devices,
4. Types of computers.
5. Types of printers.
6. Types of scanners.
7. Storage devices and storage capacity of various storage devices.
8. Comparison of various parts based on cost.
9. Tools and equipment required.
10. Procedures for preparation of Aadhar Card, Green Card, ID Card,
11. Work environment,
12. Any other information

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.

- Desktop Computers,
- Peripherals,
- Network devices,
- Bio-metric devices,
- Punching Machine,
- Digital Dongle,
- Scanner
- Iris scanner
- Printers
- Digital Camera
- Operating System
- LAN tester
- Utility softwares
- Anti-static wrist wrap

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:

S.No.	Qualification	Minimum Competencies	Age Limit
1	Bachelor of Engineering / Technology in Computer Science / Technology **OR** Master of Computer Science **OR** Master of Computer Application **OR** Master of Information Technology **OR** DOEACC B Level Certificate. **Desirable:** Knowledge of Biometric System.	The candidate should have a minimum of 1 year of work experience in the same job role. S/He should be able to communicate in English and local language. S/He should have knowledge of equipment, tools, material, Safety, Health & Hygiene.	18-37 years (as on Jan. 01 (year)) Age relaxation to be provided as per Govt. rules

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 counselling 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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