

**LEARNING OUTCOME
BASED
VOCATIONAL CURRICULUM**

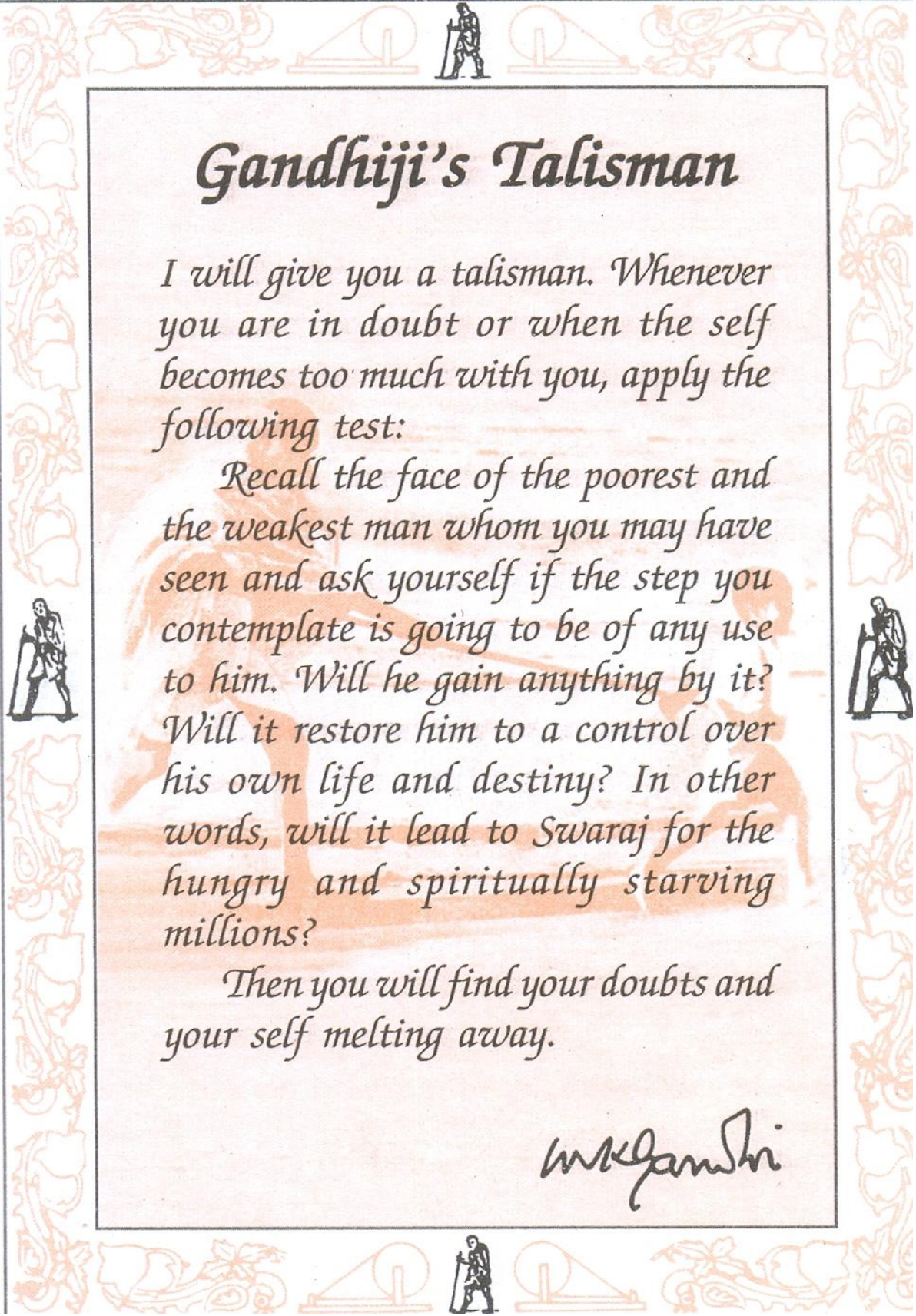
JOB ROLE: MANGO GROWER
(QUALIFICATION PACK: REF.ID.AGR/Q0302)

SECTOR: AGRICULTURE

Class 9 and 10



PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
(A Constituent unit of NCERT, under MHRD, Govt. of India)
Shyamla Hills, Bhopal- 462 013, M.P., India
<http://www.psscive.ac.in>



Gandhiji's Talisman

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

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

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

M.K. Gandhi

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Agriculture- Mango Grower

March, 2020

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FOREWORD

The Pandit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE), a constituent unit of National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based vocational curriculum and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Vocationalisation of Education under *Samagra Shiksha*. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Samagra Shiksha* of Ministry of Human Resource Development (MHRD), Govt. of India. The main purpose of the learning outcome based vocational curriculum is to bring about improvement in teaching-learning process and working competencies through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based vocational curriculum as part of the vocational training package for the job role of Mango Grower (AGR/Q0302). 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 Education Research and 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 in 2012 with the aim 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. The scheme was subsumed in *Samagra Shiksha* in 2018 along with other schemes of school education. For spearheading the Vocationalisation Education, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop learning outcome based vocational curriculum, 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 needs to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfil the needs of the society and the world of work. In order to honour its commitment to the nation, the PSSCIVE has initiated the work on developing learning outcome based vocational curriculum 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 50 job roles in various sectors, besides the curricula developed for 100 job roles.

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, 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 vocational curriculum and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Samagra Shiksha* of Ministry of Human Resource Development (MHRD), Government of India.

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 *Samagra Shiksha (SS)* and the officials of the Ministry of Human Resource Development, Government of India for the financial support to the project for development of curricula.

We are grateful to Director, National Council of Education Research & Training (NCERT) for his support and guidance. We also acknowledge the contributions of our colleagues at the Technical Support Group of *Samagra Shiksha, MHRD, National Skill Development Agency (NSDA)* and *National Skill Development Corporation (NSDC)* and *Agriculture Skill Council of India (ASCI)* for their academic support and cooperation.

We are grateful to the contributions of course coordinator Dr. Rajiv Kumar Pathak, *Professor, Department of Agriculture and Animal Husbandry, PSSCIVE, Bhopal* for their untiring efforts and the development of this learning outcome based curriculum.

The contributions made by Dr. Vinay Swarup Mehrotra, *Professor and Head, Department of Agriculture and Animal Husbandry and Curriculum Development and Evaluation Centre (CDEC)*, Dr. Vipin Kumar Jain, *Associate Professor and Head, Department of Humanities, Science, Education and Research* and Dr. Dipak D. Shudhalwar, *Associate Professor and Head, Department of engineering and Technology, PSSCIVE* in development of curriculum for employability skills are duly acknowledged.

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1. COURSE OVERVIEW

COURSE TITLE: Agriculture – Mango Grower

Mango fruit grower is responsible to cultivate mango fruit crop on a given piece of land and is responsible right from procurement of seed material to the sale of farm produce in the market.

The job of a Mango fruit grower involves cultivation of mango as per the package of practices recommended for a particular agro-climate zone, type of soil, rainfall pattern and climatic conditions to achieve the yields as per the genetic potential of a given variety and sell the produce as per the competitive market prices without distress sale. The job requires the individual to have: Ability to work independently, bearing risks and must have ability to work hard and take decisions pertaining to his area of work. The individual should be result oriented and should be responsible for his / her own learning and working. Individual should be able to comprehend basic arithmetic and algebraic principle. Should be able to access and analyze various opportunities and threats pertaining to climatic and market conditions

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 of entrepreneurial skills and abilities;
- Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection
- Describe basics of mango cultivation
- Know about the nutritional values of mango fruit
- Demonstrate soil preparation
- Demonstrate propagation of mango
- Demonstrate planting of mango
- Explain water and soil nutrient management in mango
- Demonstrate integrated weed management in mango
- Demonstrate integrated pest and disease management in mango
- Describe harvest and post-harvest management in mango
- Describe basics of farm management and Marketing
- Demonstrate health and safety issues at workplace

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

COURSE LEVEL: This is a beginner level course. On completion of this course, a student can take up an Intermediate level course for a job role in Agriculture.

COURSE DURATION: 400 hrs

Class 9 : 200 hrs

Class 10 : 200 hrs

Total : 400 hrs

2. SCHEME OF UNITS

The unit-wise distribution of hours and marks for Class 9 is as follows:

CLASS 9			
	Units	No. of Hours for Theory and Practical =200	Max. Marks for Theory and Practical =100
Part A	Employability Skills		
	Unit 1: Communication Skills-I	20	10
	Unit 2: Self-management Skills-I	10	
	Unit 3: Information and Communication Technology Skills-I	20	
	Unit 4: Entrepreneurial Skills-I	15	
	Unit 5: Green Skills-I	10	
	Total	75	10
Part B	Vocational Skills		
	Unit 1: Introduction to Mango Cultivation	20	30
	Unit 2: Land Preparation for Mango Cultivation	20	
	Unit 3: Propagation and Plantation of Mango	20	
	Unit 4: Training, Pruning and Intercultural Operations in Mango	20	
	Unit 5: Maintain Health and Safety measures at the Workplace	15	
	Total	95	30
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	05	10
	Grand Total	200	100

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

CLASS 10			
	Units	No. of Hours for Theory and Practical =200	Max. Marks for Theory and Practical =100
Part A	Employability Skills		
	Unit 1: Communication Skills – II	20	10
	Unit 2: Self-management Skills – II	10	
	Unit 3: Information and Communication Technology Skills – II	20	
	Unit 4: Entrepreneurial Skills – II	15	
	Unit 5: Green Skills – II	10	
	Total	75	10
Part B	Vocational Skills		
	Unit 1: Irrigation Management in Mango	15	30
	Unit 2: Integrated Nutrient Management in Mango	15	
	Unit 3: Integrated Pest and Disease Management for Mango	25	
	Unit 4: Harvest and Post-harvest Management of Mango	20	
	Unit 5: Basics of Farm Management and Marketing	20	
		95	30
Part C	Practical Work		
	Practical Examination	06	15
	Written Test	01	10
	Viva Voce	03	10
	Total	10	35
Part D	Project Work/Field Visit		
	Practical File/Student Portfolio	10	10
	Viva Voce	05	05
	Total	15	15
Part E	Continuous and Comprehensive Evaluation (CCE)		
	Total	05	10
	Grand Total	200	100

3. TEACHING/TRAINING ACTIVITIES

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

CLASSROOM ACTIVITIES

Classroom activities are an integral part of this course and interactive lecture sessions, followed by discussions should be conducted by trained vocational teachers. Vocational teachers should make effective use of a variety of instructional 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, 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

Maximum Marks: 30

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

SKILL ASSESSMENT (PRACTICAL)

Assessment of skills by the students should be done by the assessors/examiners on the basis of practical demonstration of skills by the candidate, using a competency checklist. The competency checklist should be developed as per the National Occupation Standards

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

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

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

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

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

CONTINUOUS AND COMPREHENSIVE EVALUATION

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

5. UNIT CONTENTS

CLASS 9

Part A: Employability Skills

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

Unit 1: Communication Skills – I			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication - Verbal - Non-verbal - Visual	1. Writing pros and cons of written, verbal and non-verbal communication 2. Listing do's and don'ts for avoiding common body language mistakes	05
2. Identify elements of communication cycle	1. Meaning of communication 2. Importance of communication skills 3. Elements of communication cycle– (I) Sender (ii) Ideas (iii) Encoding (iv) Communication channel (V) Receiver (Vi) Decoding, and (Vii) Feedback	1. Draw a diagram of communication cycle 2. Role plays on communication process related to the sector/job role	05
3. Identify the factors affecting our perspectives in communication	1. Perspectives in communication 2. Factors affecting perspectives in communication <ul style="list-style-type: none"> • Visual perception • Language • Past experience • Prejudices • Feelings • Environment 	1. Group discussion on factors affecting perspectives in communication 2. Sharing of experiences on factors affecting perspectives 3. Sharing experiences on factors affecting communication at workplace	05

4. Demonstrate the knowledge of basic writing skills	1. Writing skills related to the following: <ul style="list-style-type: none"> • Phrases • Kinds of sentences • Parts of sentence • Parts of speech • Use of articles • Construction of a paragraph 	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject	05
Total			20

Unit 2: Self-management Skills – I			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Describe the meaning and importance of self-management	1. Meaning of self-management 2. Positive results of self-management 3. Self-management skills	1. Identification of self-management skills 2. Strength and weakness analysis	05
2. Identify the factors that helps in building self-confidence	1. Factors that help in building self-confidence – social, cultural, and physical factors 2. 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.	1. Role play exercises on building self-confidence 2. Use of positive metaphors/ words 3. Positive stroking on wakeup and before going bed 4. Helping others and working for community	05
Total			10

Unit 3: Information and Communication Technology Skills – I			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Describe the role of Information and Communication Technology (ICT) in day-to-day life and workplace	1. Introduction to ICT 2. Role and importance of ICT in personal life and at workplace 3. ICT in our daily life (examples) 4. ICT tools - Mobile, tab, radio, TV, email, etc.	1. Discussion on the role and importance of ICT in personal life and at workplace. 2. Preparing posters / collages for showing the role of ICT at workplace	04

2. Identify components of basic computer system and their functions	<ol style="list-style-type: none"> 1. Computer system - Central Processing Unit (CPU), memory, motherboard, storage devices 2. Hardware and software of a computer system 3. Role and functions of Random Access Memory (RAM) and Read Only Memory (ROM) 4. Role and functions of Central Processing Unit 5. Procedure for starting and shutting down a computer 	<ol style="list-style-type: none"> 1. Connecting the cables and peripherals to the Central Processing Unit 2. Starting and shutting down a computer 3. Group discussion on the various aspects of hardware and software 	07
3. Demonstrate use of various components and peripherals of computer system	<ol style="list-style-type: none"> 1. Peripherals devices and their uses – mouse, keyboard, scanner, webcam, etc. of a computer system 	<ol style="list-style-type: none"> 1. Identification of various parts and peripherals of a computer 2. Demonstration and practice on the use of mouse 3. Demonstration and practice on the use of keyboard 4. Demonstration of the uses of printers, webcams, scanner and other peripheral devices 5. Drawing diagram of computer system and labelling it 	05
4. Demonstrate basic computer skills	<ol style="list-style-type: none"> 1. Primary operations on a computer system – input, process, storage, output, communication networking, etc. 	<ol style="list-style-type: none"> 1. Identification of the various input and output units and explanation of their purposes 	04
Total			20

Unit 4: Entrepreneurial Skills – I			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. Identify various types of business activities	<ol style="list-style-type: none"> 1. Types of businesses – service, manufacturing, hybrid 2. Types of businesses found in our community 3. Business activities around us 	<ol style="list-style-type: none"> 1. Prepare posters of business activities found in cities/villages, using pictures 2. Discuss the various types of activities, generally adopted by small businesses in a local community 3. Best out of waste 	09

		<ul style="list-style-type: none"> 4. Costing of the product made out of waste 5. Selling of items made from waste materials 6. Prepare list of businesses that provides goods and services in exchange for money 	
2. Demonstrate the knowledge of distinguishing characteristics of entrepreneurship	<ul style="list-style-type: none"> 1. Meaning of entrepreneurship development 2. Distinguishing characteristics of entrepreneurship 3. Role and rewards of entrepreneurship 	<ul style="list-style-type: none"> 1. Prepare charts showing advantages of entrepreneurship over wages 2. Group discussions on role and features of entrepreneurship 3. Lectures/presentations by entrepreneurs on their experiences and success stories 4. Identify core skills of successful entrepreneur 	06
Total			15

Unit 5: Green Skills – I			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Demonstrated the knowledge of the factors influencing natural resource conservation	<ul style="list-style-type: none"> 1. Introduction to environment, 2. Relationship between society and environment, ecosystem and factors causing imbalance 3. Natural resource conservation 4. Environment protection and conservation 	<ul style="list-style-type: none"> 1. Group discussion on hazards of deteriorating environment 2. Prepare posters showing environment conservation 3. Discussion on various factors that influence our environment 	05
2. Describe the importance of green economy and green skills	<ul style="list-style-type: none"> 1. Definition of green economy 2. Importance of green economy 	<ul style="list-style-type: none"> 1. Discussion on the benefits of green skills and importance of green economy 2. Prepare a Poster showing the importance of green economy with the help of newspaper/magazine cuttings 	05
Total			10

Part B: Vocational Skills

S. No.	Units	Duration (Hrs)
1.	Introduction to Mango Cultivation	20
2.	Land Preparation for Mango Cultivation	20
3.	Propagation and Plantation of Mango	20
4.	Traning, Pruning and Intercultural Operations in Mango	20
5.	Maintain Health and Safety measures at the Workplace	15
	Total	95

Unit 1: Introduction to Mango Cultivation

Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Introduction to Mango cultivation	<ol style="list-style-type: none"> 1. Explain Importance and scope of mango cultivation 2. Area, production, productivity and nutritional value 3. Importance of Mango to Indian Economy 	<ol style="list-style-type: none"> 1. Enlist major mango growing states of India 2. Prepare a pie chart/ bar diagram, depicting the production of Mango producing States in India 	14
2. Classify Mango	<ol style="list-style-type: none"> 1. Classification of Mango based their species, sub-species and varieties 	<ol style="list-style-type: none"> 1. Identif and enlist the Mango varieties 	06
Total			20

Unit 2: Land Preparation for Mango Cultivation

Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Select the site for Mango cultivation	<ol style="list-style-type: none"> 1. Explain the site selection criteria for Mango Cultivation <ol style="list-style-type: none"> I. Climate II. Soil III. Water quality IV. Fencing and Wind Breaks V. Road and Buildings 	<ol style="list-style-type: none"> 1. Enlist the criteria for site selection 	05

2. Identify the tools and implement use for land preparation of Mango	1. Describe tools and implement used for field preparation and planting	1. Identification of various tools and implement used in field and pit preparation for Mango	05
3. Demonstrate soil sampling	1. Describe procedure of Soil sampling	1. Demonstration of procedure for soil sampling	05
4. Prepare land for Mango cultivation	1. Describe process of land preparation 2. Describe the procedure of pit preparation	1. Demonstration of pit preparation	05
Total			20

Unit 3: Propagation and Plantation of Mango			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Propagate Mango plant	1. Selection of mother plant and development of mother block 2. Define plant propagation and its types I. Sexual propagation II. Asexual propagation	1. Enlist the criteria for selection of mother plant	07
2. Prepare Root Sock for Budding/ Grafting	1. Preparation of Root Stock for grafting 2. Preparation of bud stick for grafting 3. Commercial method of Mango propagation I. Stone Grafting II. Soft-Wood Grafting III. Inarching IV. Veneer Grafting	1. Demonstration of preparation of rootstock and bud stick 2. Demonstration of commercial method of propagation	07
3. Planting System	1. Describe various Planting system 2. Explain Planting distance	1. Demonstration of the planting system	06
Total			20

Unit 4: Training, Pruning and Intercultural Operations In Mango			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Training and Pruning in Mango plant	1. Importance of training and pruning 2. Principles of training and pruning	1. Demonstration of training and pruning practices	10

2. Intercultural operations	<ol style="list-style-type: none"> 1. Define intercultural operations 2. Importance of intercultural operations 3. Weed and weed management in Mango 4. Define Mulching <ol style="list-style-type: none"> I. Type of mulch II. Advantages and disadvantages of mulching 5. Intercropping in Mango <ol style="list-style-type: none"> I. Advantages II. Disadvantages 6. Tools and Implements used for training, pruning and interculture operations 	<ol style="list-style-type: none"> 1. Visit nearby Mango orchard and observe various intercultural operations 2. Enlist the methods of weed management 3. Identification of the tools and implements use in Mango orchard 	10
Total			20

Unit 5: Health and Safety Measures at the workplace			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. Prevent Hazardous Conditions at Workplace	<ol style="list-style-type: none"> 1. Describe the Hazard 2. Types of Hazard 3. Toxicity level of chemical 4. Explain the risk 	<ol style="list-style-type: none"> 1. Prepare a flow chart on types of hazards at a workplace 	07
2. First Aid, Treatment and Safety Equipment	<ol style="list-style-type: none"> 1. Write about First aid, Treatment and Safety equipment 2. Chemical poisoning and first aid measures 3. Safety and protective devices 4. General health and safety measures 5. Amenities and environment 6. Emergency response 7. Manual tasks 8. Chemicals and hazardous substances 9. Electricity 10. Precautions to be taken in a farm 	<ol style="list-style-type: none"> 1. Demonstration of safety devices and measures to be followed 	08
Total			15

CLASS 10

Part A - Employability Skills

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

Unit 1: Communication Skills – II			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication - Verbal - Non-verbal - Visual	1. Writing pros and cons of written, verbal and non-verbal communication 2. Listing do's and don'ts for avoiding common body language mistakes	05
2. Provide descriptive and specific feedback	1. Communication cycle and importance of feedback 2. Meaning and importance of feedback 3. Descriptive feedback - written comments or conversations 4. Specific and non-specific feedback	1. Constructing sentences for providing descriptive and specific feedback	03
3. Apply measures to overcome barriers in communication	1. Barriers to effective communication – types and factors 2. Measures to overcome barriers in effective communication	1. Enlisting barriers to effective communication 2. Applying measures to overcome barriers in communication	04
4. Apply principles of communication	1. Principles of effective communication 2. 7 Cs of effective communication	1. Constructing sentences that convey all facts required by the receiver	03

		<p>2. Expressing in a manner that shows respect to the receiver of the message</p> <p>3. Exercises and games on applying 7Cs of effective communication</p>	
5. Demonstrate basic writing skills	<p>1. Writing skills to the following:</p> <ul style="list-style-type: none"> • Sentence • Phrase • Kinds of Sentences • Parts of Sentence • Parts of Speech • Articles • Construction of a Paragraph 	1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject	05
Total			20

Unit 2: Self-management Skills – II			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Apply stress management techniques	<p>1. Meaning and importance of stress management</p> <p>2. Stress management techniques – physical exercise, yoga, meditation</p> <p>3. Enjoying, going to vacations and holidays with family and friends</p> <p>4. Taking nature walks</p>	<p>1. Exercises on stress management techniques – yoga, meditation, physical exercises</p> <p>1. Preparing a write-up on an essay on experiences during a holiday trip</p>	06
2. Demonstrate the ability to work independently	<p>1. Importance of the ability to work independently</p> <p>2. Describe the types of self-awareness</p> <p>3. Describe the meaning of self-motivation and self-regulation</p>	<p>1. Demonstration on working independently</p> <p>2. goals</p> <p>3. Planning of an activity</p> <p>4. Executing tasks in a specific period, with no help or directives</p> <p>5. Demonstration on the qualities required for working independently</p>	04
Total			10

Unit 3: Information and Communication Technology Skills– II			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Distinguish between different operating systems	<ol style="list-style-type: none"> 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 	<ol style="list-style-type: none"> 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 	17
2. Apply basic skills for care and maintenance of computer	<ol style="list-style-type: none"> Importance and need of care and maintenance of computer <ul style="list-style-type: none"> Cleaning computer components Preparing maintenance schedule Protecting computer against viruses Scanning and cleaning viruses and removing SPAM files, temporary files and folders 	<ol style="list-style-type: none"> Demonstration of the procedures to be followed for cleaning, care and maintenance of hardware and software 	03
Total			20

Unit 4: Entrepreneurial Skills – II			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. List the characteristics of successful entrepreneur	<ol style="list-style-type: none"> Entrepreneurship and society Qualities and functions of an entrepreneur Role and importance of an entrepreneur Myth about entrepreneurship Entrepreneurship as a career option 	<ol style="list-style-type: none"> 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 	15

		<p>needed to become successful entrepreneur</p> <p>5. Collect information and related data for a business</p> <p>6. Make a plan in team for setting up a business</p>	
Total			15

Unit 5: Green Skills – II			
Learning Outcome	Theory	Practical	Duration (10 hrs)
1. Demonstrate the knowledge of importance, problems and solutions related to sustainable development	<p>1. Definition of sustainable development</p> <p>2. Importance of sustainable development</p> <p>3. Problems related to sustainable development</p>	<p>1. Identify the problem related to sustainable development in the community</p> <p>2. Group discussion on the importance of respecting and conserving indigenous knowledge and cultural heritage</p> <p>3. Discussion on the responsibilities and benefits of environmental citizenship, including the conservation and protection of environmental values</p> <p>4. Preparing models on rain water harvesting, drip / sprinkler irrigation, vermin-compost, solar energy, solar cooker, etc.</p>	10
Total			10

Part B–Vocational Skills

S. No.	Units	Duration (Hrs)
1.	Irrigation Management in Mango	15
2.	Integrated Nutrient Management in Mango	15
3.	Integrated Pest and Disease Management for Mango	25
4.	Harvest and Post-Harvest Management of Mango	20
5.	Basics of Farm Management and Marketing	20
Total		95

Unit 1: Irrigation Management in Mango			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. Importance and methods of the irrigation	1. Importance of irrigation 2. Irrigation requirement 3. Methods of irrigation 4. Describe micro irrigation 5. Various components of micro irrigation system 6. Advantages and disadvantages of micro irrigation system	1. Visit to nearby commercial orchard and Observe the irrigation method 2. Identification of the different component of drip system	15
Total			15

Unit 2: Integrated Nutrient Management in Mango			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. Classify plant nutrients and its role	1. Importance of plant nutrients 2. Classification of Plant nutrients A. Macro nutrients I. Primary nutrients II. Secondary nutrients B. Micro nutrients 3. Manures and Fertilisers	1. Identification of organic and inorganic manures and fertilisers	07

2. Nutrients and their functions	1. Write about functions of plant nutrients 2. Deficiency symptoms and their corrective measures	1. Identification of various nutrients deficiency symptoms in Mango	04
3. Apply manure and fertilisers	1. Application of manures and fertilisers 2. Manures and fertilisers scheduling in mango	1. Demonstration of the method of nutrient application in Mango orchard	04
Total			15

Unit 3: Integrated Pest and Disease Management for Mango			
Learning Outcome	Theory	Practical	Duration (25 Hrs)
1. Identify major Insect-pests of Mango and their management	1. Describe major insect-pests of Mango 2. Insect-pests damage symptoms of mango 3. Integrated management practices for insect-pests	1. Identification of the major insect-pests in mango 2. Demonstration of spraying in Mango orchard 3. Enlist the different chemical insecticides	09
2. Identify major diseases of Mango and their management	1. Importance of diseases management in mango 2. Symptoms of different diseases in mango 3. Integrated disease management in mango	1. Identification of the major diseases in Mango 2. Enlist the different chemical fungicides	09
3. Identify physiological disorders of Mango and their management	1. Describe physiological disorders of Mango 2. Corrective measures	1. Identification of physiological disorders in Mango	07
Total			25

Unit 4: Harvest and Post-Harvest Management of Mango			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Harvesting process of Mango	1. Define Harvesting 2. Maturity indices of Mango 3. Method of Mango harvesting 4. Yield of Mango fruit	1. Demonstration of the harvesting process in nearby Mango orchard	12

2. Post-harvest management of Mango fruit	<ol style="list-style-type: none"> 1. Describe the post-harvest management 2. Explain post-harvest management of Mango fruit <ol style="list-style-type: none"> I. Precooling II. Grading III. Packaging IV. Storage V. Transport 	<ol style="list-style-type: none"> 1. Demonstration of the grading procedure in Mango 2. Demonstration of packaging in Mango 	08
Total			20

Unit 5: Basics of Farm Management and Marketing			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Farm Management of Mango	<ol style="list-style-type: none"> 1. Describe farm management 2. Farm resources 3. Crop Planning 	<ol style="list-style-type: none"> 1. Visit nearby MAngo orchard and note down management practices 	05
2. Cropping system and financial management	<ol style="list-style-type: none"> 1. Cropping system <ol style="list-style-type: none"> I. Intercropping II. Crop rotation 2. Financial management <ol style="list-style-type: none"> I. Input and output requirement II. Cost benefit ratio 3. Farm Record Keeping 	<ol style="list-style-type: none"> 1. Demonstration of preparing farm record for administrative and financial management 	05
3. Classify markets and marketing channels	<ol style="list-style-type: none"> 1. Describe markets and its classification 2. Describe marketing channels 	<ol style="list-style-type: none"> 1. Visit nearby fruit market and observe different mechanism 	05
4. Basic Market Information	<ol style="list-style-type: none"> 1. Define market information 2. Sources of market information 3. Describe demand and Supply 	<ol style="list-style-type: none"> 1. Collect information about market price from various source 	05
Total			20

6. ORGANIZATION OF FIELD VISITS/ ON-THE-JOB-TRAINING

In a year, at least 3 field visits/educational tours should be organised for the students to expose them to the activities in the workplace.

Visit an orchard and observe the following: Location, Site, Office building, Store, Pot yard, Packing Yard, Nursery bed, mother plant block, Water tank/Tube well. During the visit, students should obtain the following information from the owner or the supervisor of the orchard:

1. Area under cultivation and its layout
2. Methods of propagation
3. Name of varieties grown
4. Growing intercrops
5. Total production of particular fruit crop grown annually
6. Grading criteria
7. Packaging materials
8. Sale procedure
9. Work force or human power engaged
10. Total expenditure of growing fruit crop
11. Total annual income
12. Profit/Loss (Annual)
13. 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.

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|---------------------|--------------------|
| 1. Auger | |
| 2. Disc Harrow | |
| 3. Farmyard Manure | |
| 4. Fertilisers | |
| 5. Digging Spade | |
| 6. Hoe | |
| 7. Knapsack Sprayer | |
| 8. Levellers | |
| 9. Plastics Baskets | |
| 10. Plough | |
| 11. Pump sets | |
| 12. Rigid Tillers | |
| 13. Kodali | |
| | 14. Pronged hoes |
| | 15. Spade |
| | 16. Fork |
| | 17. Hoe-cum-rack |
| | 18. Shovel |
| | 19. Garden Rake |
| | 20. Hand Leveller |
| | 21. Crow –Bar |
| | 22. Cultivator |
| | 23. Axe |
| | 24. Budding Knife |
| | 25. Grafting knife |

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|--------------------------------|---|
| 26. Budding and grafting knife | 47. Coring knife |
| 27. Pruning knife | 48. Can sealer |
| 28. Secateur | 49. Can opener |
| 29. Pruning Saw | 50. Dehydrator |
| 30. Hedge Shear | 51. Crown corking machine |
| 31. Tree Pruner | 52. Hand rotary sieve |
| 32. Lopping Shear | 53. Forking machine |
| 33. Grass Shear | 54. Hand Refractometer |
| 34. Khurpi | 55. Screw type juice extractor |
| 35. Weeding Hook | 56. A compact spreader |
| 36. Straight Blade Hand Hoe | 57. Tractor |
| 37. Hand Cultivator | 58. Hand tools like; shovels, rakes, scythes, picks |
| 38. Rocker Sprayer | 59. Sorting machines |
| 39. Foot Sprayer | 60. Soil testing kit |
| 40. Hand Sprayer | 61. Measuring cylinder, pesticides. |
| 41. Hand rotary duster | 62. Pheromone traps |
| 42. Sickle | 63. Power tiller |
| 43. Hedge cutter | 64. Power sprayer |
| 44. Hydrometer | 65. Weighing machine |
| 45. Cutting knife | |
| 46. Peeling knife | |

8. VOCATIONAL TEACHER'S/ TRAINER'S QUALIFICATION AND GUIDELINES

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

Qualification	Minimum Competencies	Age Limit
Post-graduation in Agriculture/ Horticulture/ Fruit Science from a recognized Institute/ University, with at least 1 year work experience	<ul style="list-style-type: none"> • Effective communication skills (Oral and written) • Basic computing skills. 	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 *Samagra Shiksha* (SS). 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 the following ways:

(i) directly as per the prescribed qualifications and industry experience suggested by the PSS Central Institute of Vocational Education (PSSCIVE), NCERT or the respective Sector Skill Council (SSC) OR (ii) through accredited Vocational Training Providers accredited under the National Quality Assurance Framework (NQAF*) approved by the National Skill Qualification Committee on 21.07.2016. If the State is engaging Vocational Teachers/Trainers through the Vocational Training Provider (VTP), it should ensure that VTP should have been accredited at NQAF Level 2 or higher.

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

The educational qualifications required for being a Vocational Teacher/Trainer for a particular job role are clearly mentioned in the curriculum for the particular NSQF compliant job role. The State should ensure that teachers / trainers deployed in the schools have relevant technical competencies for the NSQF qualification being delivered. The Vocational Teachers/Trainers preferably should be certified by the concerned Sector Skill Council for the particular Qualification Pack/Job role which he will be teaching. Copies of relevant certificates and/or record of experience of the teacher/trainer in the industry should be kept as record.

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

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

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

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

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

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

- a) Prepare session plans and deliver sessions which have a clear and relevant purpose and which engage the students;
- b) Deliver education and training activities to students, based on the curriculum to achieve the learning outcomes;
- c) Make effective use of learning aids and ICT tools during the classroom sessions;
- d) 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;
- e) 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;
- f) Identify the weaknesses of students and assist them in upgradation of competency;
- g) Cater to different learning styles and level of ability of students;
- h) Assess the learning needs and abilities, when working with students with different abilities
- i) Identify any additional support the student may need and help to make special arrangements for that support;
- j) Provide placement assistance

Assessment and evaluation of Vocational Teachers/Trainers is very critical for making them aware of their performance and for suggesting corrective actions. The States/UTs should ensure that the performance of the Vocational Teachers/Trainers is appraised annually. Performance based appraisal in relation to certain pre-established criteria and objectives should be done periodically to ensure the quality of the Vocational Teachers/Trainers. Following parameters may be considered during the appraisal process:

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

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