

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

Job role: Baking Technician

(Qualification Pack: FIC/Q5005)

SECTOR: Food Processing

Classes 9 and 10


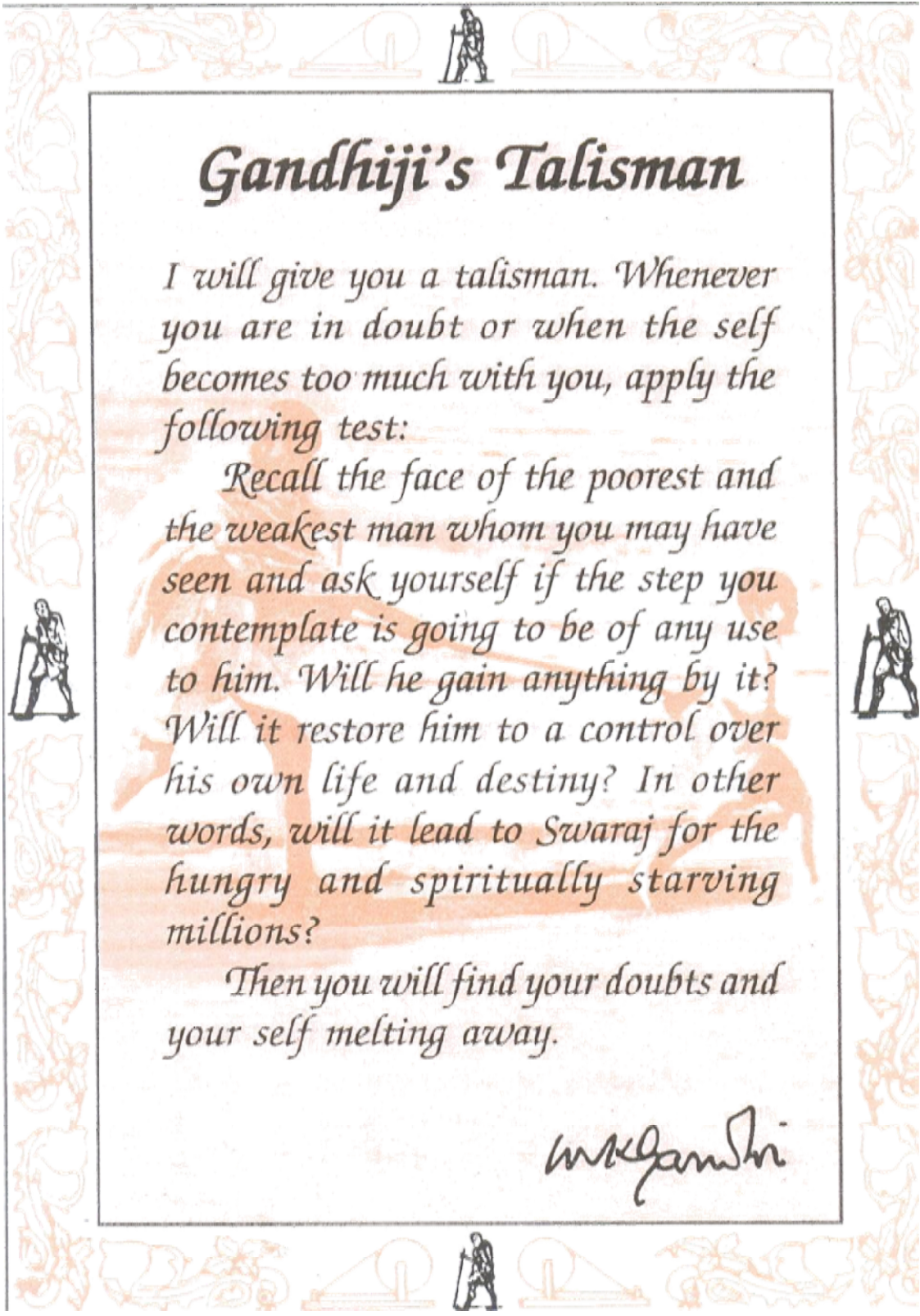


PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under MHRD, Government 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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CURRICULUM

Food processing-Baking Technician

February, 2020

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Published by:

Joint Director

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



PATRONS

Prof. Hrushikesh Senapaty, Ph.D.,
Director, National Council of Educational
Research and Training (NCERT), New
Delhi

Prof. Rajesh Khambayat, Ph.D.,
Joint Director
PSS Central Institute of Vocational Education,
Bhopal

COURSE COORDINATOR

Dr. Kuldeep Singh
Associate Professor,
Dept. of Agriculture & Animal Husbandry
PSS Central Institute of Vocational Education,
Bhopal

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 **Baking Technician (FIC/Q5005)**. The curriculum has been developed for the higher 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 fulfill 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

ACKNOWLEDGEMENTS

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

We are grateful to the Director, National Council of Educational 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 **Food Industry Capacity & Skill Initiative (FICSI)** for their academic support and cooperation.

We are grateful to the expert contributors for their earnest effort and contributions in the development of this learning outcome based vocational curriculum. Their names are acknowledged in the list of contributors.

We are also grateful to Dr. Kuldeep Singh, Course Coordinator, Department of Agriculture and Animal Husbandry, PSSCIVE, Bhopal for his contributions.

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 the curriculum for the employability skills are duly acknowledged.

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PSSCIVE Team

Contents

S.No.	Title	Page No.
	Foreword	(i)
	Preface	(ii)
	Acknowledgement	(iv)
1.	Course Overview	1
2.	Scheme of Units	2
3.	Teaching/Training Activities	3
4.	Assessment and Certification	4
5.	Unit Content	9
	Part A Employability Skills	
	Unit 1: Communication Skills – I	7
	Unit 2: Self-management Skills – II	8
	Unit 3: Information and Communication Technology Skills – I	8
	Unit 4: Entrepreneurial Skills – I	10
	Unit 5: Green Skills – I	10
	Part B Vocational Skills	
	Unit 1: Overview of Bakery Sector	11
	Unit 2: Preparation and Maintenance of Work Area and Machineries	12
	Unit 3: Food Microbiology	13
	Unit 4: Pre- preparation and Baking the Products in the Oven	13
	CLASS 10	
	Part A Employability Skills	
	Unit 1: Communication Skills – II	15
	Unit 2: Self-management Skills – II	16
	Unit 3: Information and Communication Technology Skills – II	16
	Unit 4: Entrepreneurial Skills – II	17
	Unit 5: Green Skills – II	17
	Vocational Skills	
	Unit 1: Food Safety Standards	18
	Unit 2: Hygiene and Sanitation	19
	Unit 3: Baking, Storing and Packaging	19
	unit 4: Documentation & Record Keeping	20
6.	Organisation of Field Visits	21
7.	List of Equipment and Materials	22
8.	Vocational Teacher's/ Trainer's Qualification and Guidelines	23
9.	List of Contributors	27
10.	List of Reviewer	27

1. COURSE OVERVIEW

Food Processing- Bakery Technician

A Baking Technician / Operative is responsible for baking of products, maintaining their consistency and quality, while meeting defined SOPs and leveraging his/ her skill to operate ovens in synchronization with proof box/ rest of the plant/ unit.

A Baking Technician / Operative must have the ability to plan, organize, prioritize, calculate and handle pressure. S/he must possess reading, writing and communication skills. In addition, the individual must have stamina to be able to stand for long hours, have personal and professional hygiene and an understanding of food safety standards and requirements.

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
- Identify and control hazards in the workplace that pose a danger or threat
- Do Preparation and maintain work area and equipment;
- Prepare classic and international bakery products;
- Demonstrate packaging of bakery products;
- Apply documentation and record keeping;
- Understand and maintain food quality, personal hygiene and sanitation, GMP and HACCP for bakery products

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 Food sector, such as craft baker in class XI and class XII.

Course Duration: 400 hrs

Class 9th : 200 hrs

Class 10th : 200 hrs

Total : 400 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 9 and 10, opting for vocational subject along with general education subjects. 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: Overview of Bakery Sector	20	30
	Unit 2: Preparation and Maintenance of Work Area and Machineries	20	
	Unit 3: Food Microbiology	25	
	Unit 4: Pre- preparation and Baking the Products in the Oven	30	
	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
	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 300	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: Food Safety Standards	20	30
	Unit 2: Hygiene and Sanitation	20	
	Unit 3: Baking, Storing and Packaging	25	
	Unit 4: Documentation and Record Keeping	30	
	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
	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. ASSESMENT 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: 3hrs

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

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 ascertain 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 organized 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.

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.	Entrepreneurship Development – I	15
5.	Green Skills – I	10
Total		75

Sub Unit 1: Communication Skills – I			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication <ul style="list-style-type: none"> • 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– <ul style="list-style-type: none"> • sender, • ideas, • encoding, • communication channel, • receiver, • decoding, and • 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 	1. Group discussion on factors affecting perspectives in communication 2. Sharing of experiences on factors affecting	05

	<ul style="list-style-type: none"> • Past experience • Prejudices • Feelings • Environment 	<p>perspectives</p> <p>3. Sharing experiences on factors affecting communication at workplace</p>	
4. Demonstrate the knowledge of basic writing skills	<p>1. Writing skills related to the following:</p> <ul style="list-style-type: none"> • Phrases • Kinds of sentences • Parts of sentence • Parts of speech • Use of articles • Construction of a paragraph 	<p>1. Demonstration and practice of writing sentences and paragraphs on topics related to the subject</p>	05
Total			20

Sub Unit 2: Self-management Skills – I

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

Sub Unit 3: Information and Communication Technology Skills – I

Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Describe the role of Information and	<p>1. Introduction to ICT</p> <p>2. Role and importance of ICT in personal life and</p>	<p>1. Discussion on the role and importance of ICT in personal life</p>	

Communication Technology (ICT) in day-to-day life and workplace	at workplace 3. ICT in our daily life (examples) 4. ICT tools - Mobile, tab, radio, TV, email, etc.	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	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	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	1. Peripherals devices and their uses – mouse, keyboard, scanner, webcam, etc. of a computer system	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	1. Primary operations on a computer system – input, process, storage, output, communication networking, etc.	1. Identification of the various input and output units and explanation of their purposes	04
Total			20

Sub Unit 4: Entrepreneurial Skills - I			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. Identify various types of business activities	1. Types of businesses – service, manufacturing, hybrid 2. Types of businesses found in our community 3. Business activities around	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. Costing of the product made out of waste 4. Selling of items made from waste materials 5. Prepare list of businesses that provides goods and services in exchange for money	09
2. Demonstrate the knowledge of distinguishing characteristics of entrepreneurship	1. Meaning of entrepreneurship development 2. Distinguishing characteristics of entrepreneurship 3. Role and rewards of entrepreneurship	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

Sub Unit 5: Green Skills – I			
Learning Outcome	Theory	Practical	Duration (10 Hrs)
1. Demonstrated the knowledge of the factors influencing natural resource conservation	1. Introduction to environment, 2. Relationship between society and environment, ecosystem and factors causing imbalance 3. Natural resource	1. Group discussion on hazards of deteriorating environment 2. Prepare posters showing environment conservation 3. Discussion on various	05

	conservation 4. Environment protection and conservation	factors that influence our environment	
2. Describe the importance of green economy and green skills	1. Definition of green economy 2. Importance of green economy	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	34	41	75

PART B: Vocational Skills

UNIT 1: OVERVIEW OF BAKERY SECTOR			
Learning Outcome	Theory (05Hrs)	Practical (10Hrs)	Duration (15Hrs)
1. Describe the importance of bakery sector	1. Baking process 2. Categories of bakery products 3. Overview of bakery Industry 4. Roles and responsibilities of Baking Technician	1. Visit to a nearby bakery unit for understanding the various production processes and bakery products. 2. Draw a chart depicting the categories of Bakery products.	03
2. Identify the tools and equipment used for making bakery products	1. Tools and equipment used in bakery unit	1. Identification of tools and equipment in the classroom through physical demonstration and audio visual aids.	03
3. Identify the raw material (ingredients) used in bakery.	1. Baking ingredients Categories (flour, sugar, fat, eggs milk, shortening and leavening agents) and functions of ingredients	1. Understanding of various ingredients used in baking by sensory evaluation (taste, touch, smell, sight). 2. Flour testing: Gluten development, Water absorption Power	09
Total			15

UNIT2: PREPARATION AND MAINTENANCE OF WORK AREA AND MACHINERIES			
Learning Outcome	Theory (05hrs)	Practical (10hrs)	Duration (15hrs)
1. Describe the importance of personal hygiene and sanitation of the baking technician	1. Personal Hygiene and sanitation <ul style="list-style-type: none"> • Importance of protective clothing • Personal hygiene 	1. Demonstration of how to wear protective clothing including chef coat, apron, gloves, hair caps, socks, shoes etc. 2. Demonstrate hand washing technique	02
2. Prepare work area and equipment for baking in oven	1. Preparation of work area 2. Preparation of the machines and tools 3. Unit operations 4. Food safety standards and regulations	1. Demonstrate preparation of the machines and tools required for production 2. Demonstrate the unit operations 3. Food safety standard and regulation through audio-visual aids	04
3. Utilize materials and Equipment for cleaning and maintenance of the work area	1. Cleaning materials and equipment 2. Common detergents and sanitizers 3. Disinfection of tools and equipment	1. Video and practical demonstration of the cleaning procedures in the bakery laboratory.	04
4. Maintain work areas, machines and tools	1. Working units and their functioning 2. Hygiene and sanitation standards in processing unit 3. Standard Operating Procedures (SOPs) for disposal of waste material 4. Cleaning and maintaining machinery and equipment	1. Demonstration of working units (eg. Oven, planetary dough mixer etc.) and their functioning 2. Demonstration of hygiene and sanitation standards 3. Demonstration of SOPs for disposal of waste material. 4. Demonstration of procedure for cleaning and maintaining machinery and equipment	04
Total			15

UNIT 3: FOOD MICROBIOLOGY			
Learning Outcome	Theory (10 hrs)	Practical (15hrs)	Duration (25hrs)
1. Enumerate the importance of microbes in food processing	1. Food spoilage 2. Source of microorganism in food 3. Microbial growth in food	1. Enlist useful microorganism for bakery products. 2. Identify microbial growth in baked goods	7
2. Identify types of microbial contamination (Bacteria, yeast, mold, fungus) in baked foods	1. Types of microorganism 2. Spoilage in baked products	1. Identification of baked food infected by bacteria, molds and fungus	8
3. Handle/ dispose the microbial contamination in bakery products	1. Handling and disposal of contaminated baked products	1. Practical activity on handling microbial contamination	5
4. Describe the shelf life of bakery products	1. Shelf life evaluation	1. Practical activity on shelf life evaluation in ingredients and finished products	5
Total			25

UNIT 4: PRE PREPARATION AND BAKING THE PRODUCTS IN THE OVEN			
Learning Outcome	Theory (15hrs)	Practical (25hrs)	Duration (40hrs)
1. Utilize oven for baking products	1. Types of oven, oven baking process and maintenance 2. Fuels used to fire the oven 3. Work plan <ul style="list-style-type: none"> Baker's math vis a vis raw material quantities, temperatures, and weight conversions 	1. Baking product with and without pre heating and at different temperatures	10
2. Plan production for baking products in an oven	1. Work plan of the baking 2. Pre - Production Sequence for baking 3. Dough <ul style="list-style-type: none"> (short crust, bread, pizza, pie, no time dough etc.) 	1. Depict the flow chart of process of baking 2. Demonstrate the process of: shortening,	15

	4. Processes of baking: (Shortening, creaming, leavening, fermentation, mixing, Proving/ proofing etc.)	creaming, leavening, fermentation, mixing, Proving/ proofing etc. Techniques	
3. Prepare the common bakery products using different types of dough.	1. Dough and their products (short crust, bread, pizza, pie, no time dough etc.) <ul style="list-style-type: none"> • Bread • Biscuit (Nankhatai) • Short crust pastries 2. Faults in bakery products <ul style="list-style-type: none"> • Inaccurate measurements of ingredients • Miscalculation of temperature, overheating and under heating • Over baking and under-baking 	1. Make different types of breads. 2. Identify the steps to achieve the final baked bread, namely: <ul style="list-style-type: none"> • Dough Making • Resting • Shaping • Panning • Proofing • Baking 	15
Total			40

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.	Entrepreneurship Development – II	10
5.	Green Skills – II	15
Total		75

Sub Unit 1: Communication Skills – II			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Demonstrate knowledge of various methods of communication	1. Methods of communication <ul style="list-style-type: none"> • 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 & 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 2. Expressing in a manner that shows respect to the receiver of the message 3. Exercises and games on applying 7Cs of effective communication	03
5. Demonstrate basic writing skills	2. Writing skills to the following: <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

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

Sub Unit 3: Information and Communication Technology Skills– II			
Learning Outcome	Theory	Practical	Duration (20 Hrs)
1. Distinguish between different operating systems	1. Classes of operating systems 2. Menu, icons and task bar on the desktop 3. File concept, file operations, file organization, directory structures, and file-system structures 4. Creating and managing files and folders	1. Identification of task bar, icons, menu, etc. 2. 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	1. Importance and need of care and maintenance of computer <ul style="list-style-type: none"> • Cleaning computer components • Preparing maintenance schedule 	1. Demonstration of the procedures to be followed for cleaning, care and maintenance of hardware and software	03

	<ul style="list-style-type: none"> • Protecting computer against viruses • Scanning and cleaning viruses and removing SPAM files, temporary files and folders 		
Total			20

Sub Unit 4: Entrepreneurial Skills – II			
Learning Outcome	Theory	Practical	Duration (15 Hrs)
1. List the characteristics of successful entrepreneur	1. Entrepreneurship and society 2. Qualities and functions of an entrepreneur 3. Role and importance of an entrepreneur 4. Myth about entrepreneurship 5. Entrepreneurship as a career option	1. Writing a note on entrepreneurship as career option 2. Collecting success stories of first generation and local entrepreneurs 3. Listing the entrepreneurial qualities – analysis of strength and weaknesses 4. Group discussion of self-qualities that students feel are needed to become successful entrepreneur 5. Collect information and related data for a business 6. Make a plan in team for setting up a business	15
Total			15

Sub 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	1. Definition of sustainable development 2. Importance of sustainable development 3. Problems related to sustainable development	1. Identify the problem related to sustainable development in the community 2. Group discussion on the importance of respecting and conserving indigenous knowledge and	10

		cultural heritage 3. Discussion on the responsibilities and benefits of environmental citizenship, including the conservation and protection of environmental values 4. Preparing models on rain water harvesting, drip / sprinkler irrigation, vermin-compost, solar energy, solar cooker, etc.	
Total	38	37	75

Part B: Vocational Skills

S. No.	Units	Duration (Hrs)
1.	Food Safety Standards	15
2.	Hygiene and Sanitation	20
3.	Baking, Storing and Packaging	45
4.	Documentation and Record Keeping	15
Total		95

UNIT 1: FOOD SAFETY STANDARDS			
Learning Outcome	Theory (05Hrs)	Practical (10 Hrs)	Duration (15Hrs)
1. Discuss and examine the importance of maintaining the food quality	1. Food quality 2. Factors affecting food quality 3. Food quality control measures	1. Video demonstration on the importance of food quality standards and measures.	07
2. Following food quality standard, acts and legislation in bakery unit.	1. Food safety, laws and standards <ul style="list-style-type: none"> Basic principles of HACCP Importance of HACCP Food standardization and regulatory agency (FSSAI) 	2. Draw the flow diagram of HACCP, GMP and QMS	08

	<ul style="list-style-type: none"> Food Allergy (gluten, nuts and lactose) Food Adulteration Good manufacturing practices (GMP) 		
Total			15

UNIT 2: HYGIENE AND SANITATION

Learning Outcome	Theory (08Hrs)	Practical (12 Hrs)	Duration (20Hrs)
1. Explain and follow hygiene and sanitation practices in the work area	1. Importance of safety, hygiene and sanitation in work area 2. Personal hygiene and sanitation guidelines. 3. Industry standards to maintain a safe and hygienic workplace	1. Demonstrate common methods of hygiene and sanitation	7
2. Explain safety practices in the work area	1. Potential safety hazards at work place 2. Safety signs and symbols 3. Do's and Don'ts of handling the equipment (dough mixers, dough sheeters, Oven, Mixer grinder)	1. Demonstrate functions of the equipment 2. Identify safety and hazards symbols	7
3. Undertake physical and biological methods of treating waste materials	1. Procedure for treating waste materials using physical and biological methods	3. Disposing waste safely and correctly in a designated area	6
Total			20

UNIT 3: BAKING, STORING AND PACKAGING

Learning Outcome	Theory (15 Hrs)	Practical (30 Hrs)	Duration (45 Hrs)
1. Describe the quality parameters of raw ingredients and prepare the dough and batter.	1. Quality parameters of ingredients: <ul style="list-style-type: none"> Flour Sugar Fat Egg Leavening agents 	1. Identify difference between dough and batter. 2. Identify the	20

	<ul style="list-style-type: none"> Flavors and Condiments etc. 2. Preparations of batter (muffin, cakes), dough (soft roll dough, hard roll dough, multigrain dough, sweet short crust pastry) and proofing	under proofed and over proofed dough. 2. Identify half-baked, baked and over baked products.	
2. Explain types of oven, fuels and oven baking processes	1. Ovens 2. Oven baking process 3. Cooling procedures for different baked products 4. Do's and Don'ts of baking	1. Visit to nearby baking facility to see the difference between Continuous and batch making process	10
3. Describe processes, importance and parameters of checking quality, packing and storage of bakery products	1. Packaging of bakery products 2. Storage of raw material 3. Storage and shelf life of finished products	1. Demonstrate cooling, packing and storage process of bread, biscuit, cakes, rusk/ toast.	8
4. Enumerate the steps of post production cleaning and maintenance of process equipment	1. Cleaning machinery, tools and equipment 2. Cleaning procedures 3. Minor repairs	1. Demonstrate the differences between CIP and COP. 2. Enlist the items cleaned through COP.	7
Total			45

UNIT 4: DOCUMENTATION AND RECORD KEEPING

Learning Outcome	Theory (05Hrs)	Practical (10 Hrs)	Duration (15 Hrs)
1. Keep record of raw material at collection stage and understand loading process of raw material details in enterprise resource planning (ERP)	1. Record keeping 2. Documentation of raw material 3. Enterprise resource planning (ERP).	Visit to any food industry/ audio visual demonstration of record keeping. Creating a inventory management of	5

		raw materials.(material in, material out, opening stock and remaining stock)	
2. Assess the details to be documented at production schedule	1. Maintaining records of production schedule 2. Maintaining records production process	1. Demonstration of record maintenance process at production schedule and process stages	5
3. Maintains and document records	1. Record maintenance of finished products 2. Using ERP for finished product	Demonstrate the Record of finished product.	5
Total			15

6. ORGANISATION OF FIELD VISITS

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

Visit a Bakery industry and observe the following: Location, Site, Office building, Store, Washing chamber, weighing room, packaging material, Packing chamber, storage chamber etc. During the visit, students should obtain the following information from the owner or the supervisor of the industry/processing unit:

1. Types of processed foods at the industry
2. Types of packaging material used
3. Types of products prepared
4. Total input and output handled annually
5. Manpower engaged
7. Total annual income
8. Profit/Loss (Annual)
9. 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.

Equipment

- Baking oven
 - Deck Oven (double deck manual)
 - Convection Oven' (7 trays, 600 mm/400mm)
 - Rotary Oven
 - (either choose gas or electricity operated oven)
- Hand blender cum mixer
- Mixer and grinder 5 lt
- Planetary mixer 5 lt and 20 lt.
- Spiral mixer 20 lt
- Refrigerator two door: 3 no (550 lt.)
- Vertical four door Freezer 1100 lt.
- Weighing scale

Utensils and tools

Marble Table top

- Serrated Bread Knife
- Bread tin/ mould
- Aluminium Cake pan
- Cooling racks
- Dough scrapers and plastic
- Flour sifter/ sieves
- Apron & head gear
- Gloves
- Hand towels
- Icing comb
- Measuring cup and Measuring jug
- Measuring spoon
- Mixing bowl/vessels

- Moulds/cutter
- Muffin tray
- Nozzle set
- Parchment paper
- Pallet knife straight and bent
- Piping bag
- Plates
- Rolling pin
- Cake rings
- Spatula and pastry brush
- Spoon(big and small)
- Storage containers
- Strainer
- Turn table
- Wire whiskers
- Water storage can
- Packaging material food grade
- Pizza cutter
- Dough sheeter

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:

S.No.	Qualification	Minimum Competencies	Age Limit
1.	1. Graduation (3 year and 4 year degree) in Food Science & Nutrition/ Food Technology/ Hotel Management/ Home Science/ from a	<ul style="list-style-type: none"> • Expertise in bakery product preparation • Knowledge of computer skills • Excellent communication skills 	22-45 years (as on Jan.01 (year)) Age relaxation to be provided as per Govt.rules

	<p>recognized Institute/University, with at least 2 year work experience in hospitality/ Hotel management/Bakery lab or</p> <p>2. 3 year diploma in Hotel Management and Catering Technology from recognized (AICTE) approved University, Colleges, or Institute with 2 year experience from reputed bakery brand.</p> <p>or</p> <p>3. 1 year Diploma in culinary arts from reputed culinary Institute in India or abroad.</p> <p>or</p> <p>4. 1 year craft course with 4 year working experience in bakery company</p>		
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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 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 organizations involved in education and training must meet in order to be accredited by competent bodies to provide government-funded education and training/skills activities. This is applicable to all organizations offering NSQF-compliant qualifications.

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

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

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

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

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

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

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

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

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

1. Participation in guidance and counseling 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 up gradation of knowledge and skills related to the vocational pedagogy, communication skills and vocational subject;
5. Membership of professional society at District, State, Regional, National and International level;
6. Development of teaching-learning materials in the subject area;
7. Efforts made in developing linkages with the Industry/Establishments;
8. Efforts made towards involving the local community in Vocational Education
9. Publication of papers in National and International Journals;
10. Organization of activities for promotion of vocational subjects;
11. Involvement in placement of students/student support services.

9. List of Contributors

1. Dr. Preeti Dixit, Consultant, Department of Agriculture and Animal Husbandry, PSSCIVE, Bhopal.
2. Dr. Haider Naqvi, Head, Hospitality and Tourism Management, Jagaran Lake City University, Bhopal.
3. Dr. Dipika Agrahar Murugkar, Principal Scientist and National Fellow, ICAR-Central Institute of Agriculture Engineering, Bhopal.
4. Mr. Nisar Ahmad, Executive Chef, Bhopal Baking Company, Bhopal.
5. Mr. Parvar Pachouri, Lecturer, Institute of Hotel Management, Bhopal.

10. List of Reviewers

1. Chef Pervinder Singh Bali, Corporate Chef, Oberoi Centre of Learning and Development, New Delhi
2. Mr. Narinder Singh Bhuie, Ex. Director of Studies, National Council for Hotel Management and Catering Technology, New Delhi
3. Chef Amit Gupta, Vice Principal, Nirali Cookery & Bakery Institute, Nagpur
4. Riya Dhar, Head Standard & Quality Assurance, Food Industry Capacity & Skill Initiative (FICSI), New Delhi

विद्यया ऽ मृतमश्नुते



एन सी ई आर टी
NCERT

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

(a constituent unit of NCERT, under MHRD, Government of India)

Shyamla Hills, Bhopal- 462 013, M.P., India