LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE: Agriculture Machinery Operator

(QUALIFICATION PACK: Ref. Id. AGR/Q1103)

SECTOR: Agriculture

Classes 11 and 12

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.

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

JOB ROLE: Agriculture Machinery Operator

(QUALIFICATION PACK: Ref. Id. AGR/Q1103)

SECTOR: Agriculture

Classes 11 and 12

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION

Shyamla Hills, Bhopal- 462013, M.P., India

http://www.psscive.ac.in

LEARNING OUTCOME BASED VOCATIONAL CURRICULUM

Agriculture – Agriculture Machinery Operator
February, 2020

http://www.psscive.ac.in

Published by:
Joint Director
PSS Central Institute of Vocational Education, NCERT, Shyamla Hills, Bhopa

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

Prof. Saurabh Prakash, Ph.D.,
Professor,
Department of Engineering and Technology
PSS Central Institute of Vocational Education
Bhopal

FOREWORD

The Panit Sunderlal Sharma Central Institute of Vocational Education (PSSCIVE) a constituent of the National Council of Educational Research and Training (NCERT) is spearheading the efforts of developing learning outcome based curricula and courseware aimed at integrating both vocational and general qualifications to open pathways of career progression for students. It is a part of Centrally Sponsored Scheme of Vocationalisation of Secondary and Higher Secondary Education (CSSVSHSE) launched by the Ministry of Human Resource Development, Government of India in 2012. The PSS Central Institute of Vocational Education (PSSCIVE) is developing curricula under the project approved by the Project Approval Board (PAB) of *Rashtriya Madhyamik Shiksha Abhiyan* (RMSA). The main purpose of the competency based curricula is to bring about the improvement in teaching-learning process and working competences through learning outcomes embedded in the vocational subject.

It is a matter of great pleasure to introduce this learning outcome based curriculum as part of the vocational training packages for the job role of Agriculture Machinery operator. 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 that aims to provide for the diversification of educational opportunities so as to enhance individual employability, reduce the mismatch between demand and supply of skilled manpower and provide an alternative for those pursuing higher education. For spearheading the scheme, the PSS Central Institute of Vocational Education (PSSCIVE) was entrusted the responsibility to develop learning outcome based curricula, student workbooks, teacher handbooks and e-learning materials for the job roles in various sectors, with growth potential for employment.

The PSSCIVE firmly believes that the vocationalisation of education in the nation need to be established on a strong footing of philosophical, cultural and sociological traditions and it should aptly address the needs and aspirations of the students besides meeting the skill demands of the industry. The curriculum, therefore, aims at developing the desired professional, managerial and communication skills to fulfill the needs of the society and the world of work. In order to honour its commitment to the nation, the PSSSCIVE has initiated the work on developing learning outcome based curricula with the involvement of faculty members and leading experts in respective fields. It is being done through the concerted efforts of leading academicians, professionals, policy makers, partner institutions, Vocational Education and Training experts, industry representatives, and teachers. The expert group through a series of consultations, working group meetings and use of reference materials develops a National Curriculum. Currently, the Institute is working on developing curricula and courseware for over 100 job roles in various sectors.

We extend our gratitude to all the contributors for selflessly sharing their precious knowledge, acclaimed expertise, and valuable time and positively responding to our request for development of curriculum. We are grateful to MHRD and NCERT for the financial support and cooperation in realizing the objective of providing learning outcome based modular curricula and courseware to the States and other stakeholders under the PAB (Project Approval Board) approved project of *Rashtriya Madhyamik Shiskha Abhiyan* (RMSA) of MHRD.

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

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

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

We are grateful to the 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 RMSA, MHRD, RMSA Cell at the National Council of Educational Research and Training (NCERT), National Skill Development Agency (NSDA), National Skill Development Corporation (NSDC) and Agriculture Skill Council of India (ASCI) and **Agriculture Machinery Operator (AGR/Q1103)** 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 contributor.

We are also grateful to Dr. Saurabh Prakash, Professor and Course Coordinator, Department of Engineering and Technology, PSSCIVE, Bhopal for his untiring efforts and contributions in the development of this learning outcome based curriculum.

The contributions made by Vinay Swarup Mehrotra, Professor and Head, Curriculum Development and Evaluation Centre (CDEC), Vipin Kumar Jain, Associate Professor and Head, Programme Planning and Monitoring Cell (PPMC) and Dipak Shudhalwar, Associate Professor, Department of Engineering and Technology, PSSCIVE in the development of the curriculum for employability skills are duly acknowledged.

The contribution by Dr. Satyendra Thakur, Consultant and Er. Kuber Singh, Consultant, Department of Engineering and Technology, PSSCIVE, Bhopal is acknowledged. The assistance provided by Vinod K. Soni, Computer Operator Gr.II, Department of Engineering and Technology, PSSCIVE, Bhopal for layout, design and composing of the material is duly acknowledged.

PSSCIVE Team

CONTENTS

1. COURSE OVERVIEW

COURSE TITLE: Agriculture – Agriculture Machinery Operator

An Agriculture Machinery Operator is responsible for operating machineries used in farming processes such as tilling, planting seeds, fertilizing plants, spraying and dusting of plants and harvesting crops and also responsible for carrying out periodical maintenance procedures for the same and making minor adjustments.

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 a computer;
- ☐ Demonstrate self-management skills;
- ☐ Demonstrate the ability to provide a self-analysis in context of entrepreneurial skills and abilities;
- ☐ Demonstrate the knowledge of the importance of green skills in meeting the challenges of sustainable development and environment protection;
- ☐ Discuss and identify the agricultural machinery in the farm;
- ☐ Procure the materials required for setting up the agriculture machinery;
- ☐ Test and commission the agriculture machinery in the farm;
- ☐ Train the farmers to use the agriculture machinery;
- ☐ Troubleshoot the problems with the agriculture machinery at the farm site;
- ☐ Demonstrate the knowledge of the design, operation and maintenance of agriculture machinery.

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

COURSE LEVEL: On completion of this course, a student can take up a course for a job role in Agriculture.

COURSE DURATION: **600 hrs**

Class 11	:	300 hrs
Class 12	:	300 hrs
Total	**:**	**600 hrs**

2. SCHEME OF UNITS

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

CLASS 11			
Units		**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory and Practical 100**
Part A	**Employability Skills**		
	Unit 1 : Communication Skills-III	25	10
	Unit 2 : Self-management Skills-III	25	
	Unit 3 : Information and Communication Technology Skills-III	20	
	Unit 4 : Entrepreneurial Skills-III	25	
	Unit 5 : Green Skills-III	15	
	Total	**110**	**10**
Part B	**Vocational Skills**		
	Unit 1: History of Agricultural Mechanization in India	10	40
	Unit 2: Introduction of Tractor	60	
	Unit 3: Agriculture Machinery and its Operation	70	
	Unit 4: Operational Safety	25	
	Total	**165**	**40**
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	**300**	**100**

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

CLASS 12			
	Units	**No. of Hours for Theory and Practical 300**	**Max. Marks for Theory and Practical 100**
Part A	**Employability Skills**		
	Unit 1 : Communication Skills-IV	20	10
	Unit 2 : Self-management Skills-IV	10	
	Unit 3 : Information and Communication Technology Skills-IV	20	
	Unit 4 : Entrepreneurial Skills-IV	15	
	Unit 5 : Green Skills-IV	10	
	Total	**110**	**10**
Part B	**Vocational Skills**		
	Unit 1: Use of Engine in Agriculture Machinery	30	40
	Unit 2: Land Leveling /Shaping Machine	15	
	Unit 3: Power Tiller	30	
	Unit 4: New Technology and Future of Agriculture Machinery	60	
	Unit 5: Custom Hiring of Agricultural Machinery	30	
	Total	**165**	**40**
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	**300**	**100**

3. TEACHING/TRAINING ACTIVITIES

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

CLASSROOM ACTIVITIES

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

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, and 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: 40**

		No. of Questions			
	Typology of Question	**Very Short Answer (1 mark)**	**Short Answer (2 Marks)**	**Long Answer (3 Marks)**	**Marks**
1.	Remembering – (Knowledge based simple recall questions, to know specific facts, terms, concepts, principles, or theories; identify, define or recite, information)	**3**	**2**	**2**	**13**
2.	Understanding – (Comprehension – to be familiar with meaning and to understand conceptually, interpret, compare, contrast, explain, paraphrase, or interpret information)	**2**	**3**	**2**	**14**
3.	Application – (Use abstract information in concrete situation, to apply knowledge to new situations: Use given content to interpret a situation, private an example, or solve a problem)	**0**	**2**	**1**	**07**
4.	High Order Thinking Skills – (Analysis 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**	**2**	**0**	**04**
5.	Evaluation – (Appraise, judge, and/or justify the value or worth of a decision or outcome, or to predict outcomes based on values)	**0**	**1**	**0**	**02**
	Total	**5x1=5**	**10x2=20**	**5x3=15**	**40 (20 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 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 and 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.

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.

5. UNIT CONTENTS

CLASS 11

Part A: Employability Skills

S.No.	Units	Duration (Hrs)
1.	Unit 1: Communication Skills - III	25
2.	Unit 2: Self-management Skills - IIII	25
3.	Unit 3: Information and Communication Technology Skills- III	20
4.	Unit 4: Entrepreneurial Skills - III	25
5.	Unit 5: Green Skills - III	15
	Total	**110**

UNIT 1: COMMUNICATION SKILL – III			
Learning Outcome	**Theory (10 hrs)**	**Practical (15 hrs)**	**Duration (25 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 specific communication styles	1. Communication styles- assertive, aggressive, passive- aggressive, submissive, etc.	1. Observing and sharing communication styles of friends, teachers and family members and adapting the best practices 2. Role plays on communication styles.	10
3. Demonstrate basic writing skills	1. Writing skills to the following: • 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	10
		Total	**25**

UNIT 2: SELF-MANAGEMENT – III			
Learning Outcome	**Theory (10 hrs)**	**Practical (15 hrs)**	**Duration (25 Hrs)**
1. Demonstrate impressive appearance and grooming	1. Describe the importance of dressing appropriately, looking decent and positive body language 2. Describe the term grooming 3. Prepare a personal grooming checklist 4. Describe the techniques of self- exploration	1. Demonstration of impressive appearance and groomed personality 2. Demonstration of the ability to self- explore	10
2. Demonstrate team work skills	1. Describe the important factors that influence in team building 2. Describe factors influencing team work	1. Group discussion on qualities of a good team 2. Group discussion on strategies that are adopted for team building and team work	10

3. Apply time management strategies and techniques	1. Meaning and importance of time management – setting and prioritizing goals, creating a schedule, making lists of tasks, balancing work and leisure, using different optimization tools to break large tasks into smaller tasks.	1. Game on time management 2. Checklist preparation 3. To-do-list preparation	05
		Total	**25**

UNIT 3: INFORMATION AND COMMUNICATION TECHNOLOGY – III			
Learning Outcome	**Theory (08 hrs)**	**Practical (12 hrs)**	**Duration (20 Hrs)**
1. Create a document on word processor	1. Introduction to word processing. 2. Software packages for word processing. 3. Opening and exiting the word processor. 4. Creating a document	1. Demonstration and practice of the following: • Listing the features of word processing • Listing the software packages for word processing • Opening and exit the word processor • Creating a document	10
2. Edit, save and print a document in word processor	1. Editing text 2. Wrapping and aligning the text 3. Font size, type and face. 4. Header and Footer 5. Auto correct 6. Numbering and bullet 7. Creating table 8. Find and replace 9. Page numbering. 10. Printing document. 11. Saving a document in various formats.	1. Demonstration and practicing the following: • Editing the text • Word wrapping and alignment • Changing font type, size and face • Inserting header and footer • Removing header and footer 2. Using autocorrect option 3. Insert page numbers and bullet 4. Save and print a document	10
		Total	**20**

UNIT 4: ENTREPRENEURIAL SKILLS – III			
Learning Outcome	**Theory (10 hrs)**	**Practical (15 hrs)**	**Duration (25 Hrs)**
1. Describe the significance of entrepreneurial values and attitude	1. Values in general and entrepreneurial values 2. Entrepreneurial value orientation with respect to innovativeness, independence, outstanding performance and respect for work	1. Listing of Entrepreneurial values by the students. 2. Group work on identification of entrepreneurial values and their roles after listing or reading 2-3 stories of successful entrepreneur 3. Exhibiting entrepreneurial values in Ice breaking, rapport building, group work and home assignments	10
2. Demonstrate the knowledge of attitudinal changes required to become an entrepreneur	1. Attitudes in general and entrepreneurial attitudes 2. Using imagination/ intuition 3. Tendency to take moderate risk 4. Enjoying freedom of expression and action 5. Looking for economic opportunities 6. Believing that we can change the environment 7. Analyzing situation and planning action 8. Involving in activity	1. Preparing a list of factors that influence attitude in general and entrepreneurial attitude 2. Demonstrating and identifying own entrepreneurial attitudes during the following micro lab activities like thematic appreciation test 3. Preparing a short write-up on "who am I" 4. Take up a product and suggest how its features can be improved 5. Group activity for suggesting brand names, names of enterprises, etc.	15
		Total	**25**

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

Part B: Vocational Skills

S. No.	Units	Duration (Hrs)
1.	Unit 1: History of Agricultural Mechanization in India	10
2.	Unit 2: Introduction of Tractor	60
3.	Unit 3: Agriculture Machinery and its Operation	70
4.	Unit 4: Operational Safety	25
	Total	**165**

UNIT 1: HISTORY OF AGRICULTURAL MECHANIZATION IN INDIA			
Learning Outcome	**Theory (04 Hrs)**	**Practical (06 Hrs)**	**Duration (10 Hrs)**
1. Describe the development of agricultural mechanization in India	1. Need and Role of agricultural machinery in agriculture. 2. Traditional agricultural machinery 3. Developments in agriculture mechanization 4. Present scenario of agricultural mechanization in	1. Make a list of traditional agriculture equipment/machines 2. Identification of traditional and modern agricultural machinery 3. Draw the sketches of traditional and modern agricultural machinery	10

	different agro-climatic zones/regions	4. List the agricultural machinery in different agro-climatic zones/regions	
		Total	**10**

UNIT 2: INTRODUCTION OF TRACTOR			
Learning Outcomes	**Theory (20 Hrs)**	**Practical (40 Hrs)**	**Duration (60 Hrs)**
1. Able to explain the importance of tractor in agriculture	1. Introduction- What is Tractor? 2. Importance of tractor in agriculture	1. Draw a sketch of tractor	05
2. Able to describe types of tractor with their specification	1. Types of tractor - horse power basis 2. Tractor selection criteria - crop based, soil types, land size 3. Brands and Model available in India	1. Visit to tractor dealer shop 2. Identify different types of tractor 3. Make list of different brands and models of tractor using news paper, website, company dealer, agriculture department	10
3. Able to explain the engine component and systems	1. Awareness about different systems of tractor • Engine - different components and sub-assemblies of engine system - air intake, - cooling, • Fuel supply - fuel pump, • Lubrication • Transmission - clutch, - gear box, - differential and final drive, - driving wheel - PTO • Steering and controls - dashboard - steering wheel, - brake, • Hydraulic system	1. Draw the sketch of tractor showing different sub -assemblies 2. Draw the line diagram of cooling system 3. Draw the line diagram of lubrication system 4. Draw the line diagram of transmission system 5. Draw the wiring diagram of electrical system 6. Identify the oils used for engine, air cleaner, transmission and hydraulic systems 7. Identify different parts of engine 8. Identify the different systems 9. Identify the tyres used in tractor in front and rear wheel- size and tyre pressure	15

	and three point linkage • Tractor auto electrical system (alternator, self starter, battery)		
4. Able to understand correct driving techniques and rules	1. Driving license and traffic signals 2. Correct driving techniques Pre-starting checkup- air cleaner, brake, clutch, hydraulic, oil, tyre pressure, fuel, coolant in radiator, fan belt tension, greasing point, battery and fuse box 3. Tractor driving tips in different situations like agriculture field , road, slope, ridges, with and without loading 4. Importance of logbook	1. List the document required for acquiring tractor driving license 2. Identify the traffic signals 3. Make a list of Pre-starting checkup 4. Tractor driving practice, driving in different shapes and pattern, implement hitching practice, trolley front and reverse practice 5. Make a list of precautions to be taken during tractor driving 6. Reading, writing and maintaining logbook	15
5. Able to describe preventive and periodical maintenance	1. Preventive maintenance- 2. Checking of engine oil, brake oil, tyre pressure, gear oil, coolant in radiator, hydraulic oil, drain plug	1. Study of operator manual of tractor 2. Check engine oil level 3. Check fan belt tension 4. Check coolant level in radiator 5. Check tyre pressure 6. Check gear oil/ hydraulic 7. Check drain plug	10
6. Able to explain about periodical maintenance	1. Periodical maintenance - 10 h maintenance, - 50 h maintenance - 200 h maintenance - 400 h maintenance - 1000 h maintenance	1. Make a list of periodical schedule and items of maintenance for two or three models of tractors	05
		Total	**60**

UNIT 3: AGRICULTURE MACHINERY AND ITS OPERATION			
Learning Outcomes	**Theory (30 Hrs)**	**Practical (40 Hrs)**	**Duration (70 Hrs)**
1. Identify and operate primary tillage equipments	1. Primary tillage equipments - Mould board plough - Disc plough, - Rotavator - Cage wheel - Paddy puddler	1. Identify the parts of primary tillage equipments - Mould board Plough, Disc plough, Rotavator ,Cage wheel and Paddy puddler	

	Constructional features, selection, adjustments, periodical maintenance, operational techniques, guidelines for safe operation, off seasonal storage.	2. Make the sketches of Mould board Plough, Disc plough, Rotavator ,Cage wheel and Paddy puddler 3. Hitching implement with tractor 4. Practice adjustment of implements 5. Field operation practice of different implements with tractor 6. Make a list of safety guidelines and tips during operation 7. Make a list of off seasonal storage of agricultural implements and equipment	10
2. Identify and operate secondary tillage equipments	1. Secondary tillage equipment - Cultivator, - Disc harrow, - Power harrow Constructional features, selection, adjustments, periodical maintenance, operational techniques, guidelines for safe operation, off seasonal storage	1. Identify the parts of secondary tillage implements - Cultivator, disc harrow, power harrow 2. Make the sketches of Cultivator, disc harrow, power harrow 3. Hitching implement with tractor 4. Practice adjustment of implements 5. Field operation practice of different implements with tractor 6. Make a list of safety guidelines and tips during operation 7. Make a list of off seasonal storage of agricultural implements and equipment	10
3. Identify Sowing, Planting, transplanting , fertilizer equipments	1. Sowing, planting, transplanting, fertilizer equipments - Conservation drills, - Seed cum fertilizer drill - Rice transplanter, - Raised bed planter, - Sugarcane cutter planter, - Potato planter, - Cotton planter, Constructional features of above equipments, selection, adjustments and calibration, nursery raising techniques in	1. Identify the parts of Sowing, Planting, transplanting , fertilizer equipments- Conservation drills, Seed cum fertilizer drill, Rice transplanter, Raised bed planter, sugarcane cutter planter, potato planter, cotton planter 2. Make the sketches of Conservation drills, Seed cum fertilizer drill, Rice transplanter, Raised bed planter, sugarcane cutter planter, potato planter,	10

	rice transplanter periodical maintenance, operational techniques, guidelines for safe operation, off seasonal storage	cotton planter 3. Hitching implement with tractor 4. Calibration of seed cum fertilizer drills and planters 5. Practice adjustment of implements 6. Practice of operational techniques 7. Make a list of safety guideline and tips during operation 8. Make a list of off seasonal storage of agriculture equipment 9. Prepare a mat type nursery for raising seedlings for rice transplanter	
4. Describe the Interculture, fertilizing	1. Interculture and fertilizing - manual and power weeder - manual and tractor drawn fertilizer broadcaster Constructional features, selection, adjustments and calibration, nursery raising techniques in rice transplanter periodical maintenance, operational techniques, guidelines for safe operation, off seasonal storage	1. Identify the parts of manual and power weeder, manual and tractor drawn fertilizer broadcaster 2. Make the sketches of manual and power weeder, manual and tractor drawn fertilizer broadcaster 3. Hitching implement with tractor 4. Calibration of fertilizer broadcaster 5. Practice adjustments of implements 6. Practice of operational techniques 7. Make a list of safety guidelines and tips during operation 8. Make a list of off seasonal storage of agriculture equipments	10
5. Differentiate between sprayers and dusters	1. Plant protection equipments - Sprayers and dusters Constructional features, selection, adjustments and calibration, periodical maintenance, operational techniques, guidelines for safety and precautions in operation, off seasonal storage	1. Identify the parts of manual and power sprayers and dusters 2. Make the sketches of manual and power sprayers and dusters 3. calibration of manual sprayers and dusters 4. Practice adjustments of sprayers and dusters 5. Practice of operational techniques 6. Make a list of safety guidelines and tips during operation	10

		7. Make a list of off seasonal storage of manual and power sprayers and dusters	
6. Able to describe the Irrigation pumps	1. Irrigation pumps - Types of pumps used in agriculture (centrifugal and submersible) - Working principle - Constructional details - Applications - Selection criteria of pumps - Power connection - Installation of pumps	1. Identify the Types of pumps used in agriculture 2. Practice on installation of pumps , prime mover, pipe fittings and valves, checking for correct operations 3. Power connection to pump motor and starter 4. Check the line voltage, current and direction of rotation of motor 5. Maintenance and trouble shooting	10
7. Able to describe harvesting and threshing machinery	1. Vertical conveyer, reaper and binder, thresher, winnower, chaff cutter Constructional features, selection, adjustments and calibration, periodical maintenance, operational techniques, guide lines for safety and precautions in operation, off seasonal storage	1. Identify the parts of Vertical conveyer reaper and binder, thresher, winnower, Chaff cutter 2. Make the sketches of Vertical conveyer reaper and binder, thresher, winnower, Chaff cutter 3. Practice adjustments of implements 4. Practice of operational techniques 5. Make a list of safety guidelines and tips during operation 6. Make a list of off seasonal storage of Vertical conveyer reaper and binder, thresher, winnower, Chaff cutter	10
		Total	**70**

UNIT 4: OPERATIONAL SAFETY			
Learning Outcomes	**Theory (10 Hrs)**	**Practical (15 Hrs)**	**Duration (25 Hrs)**
1. Describe the operational safety measures of handling tractor and machinery	1. Importance of valid documents- license, registration and insurance 2. Familiarity and acquaintance with the machine	1. Make a list of valid documents 2. Reading of operator manual 3. Make a list of pre start checkup 4. List general safety rules	20

	- Understanding operators' manual 3. Safety precautions before operation - Pre start checkups 4. Safety precautions during operation - on field - off the field 5. Driving precautions during operations in hilly terrain/embankments/ bunds/ditches 6. Driving precautions during trolley operations 7. Use slow moving 8. Use of safety sign boards while repairing and changing on the road 9. Awareness about traffic rules and signs 10. General safety rules while operating tractor 11. Safety precaution while operating thresher, chaff cutter 12. Safety precaution while operating plant protection equipments 13. First Aid 14. Safe disposal of hazardous material	while operating tractor - Proper dressing - Cleaning machinery - Do not get on or off from tractor while in motion - Don't use tractor as public transport - Use slow moving emblem - Use brakes properly - Avoid sharp turning at high speeds - Avoid operating tractor near ditches, embankment slope and holes - While travelling downhill operates at low gears and low throttle, don't disengage clutch - If you get stuck take help from another tractor - Don't put your foot over the clutch pedal - Trolley hitch should be correct - Use seatbelts while using rops - Open the radiator cap slowly - Fill the fuel after the work - PTO safety 5. Make a list of safety road signs 6. List of precautions to be followed while using plant protection equipments 7. List of precautions to be followed while using thresher 8. Practice use of fire extinguisher	
2. Able to describe management of agri-eco systems (soil, water, land, plant and air) while using tractor and agricultural machineries	1. Management of agri-eco systems (soil, water, land, plant and air) while using tractor and agricultural machineries	1. List the different measures to be followed for management of agri-eco systems while using tractor and agricultural machineries	05
		Total	**25**

CLASS 12

Part A: Employability Skills

S.No.	Units	Duration (Hrs.)
1.	Unit 1: Communication Skills- IV	25
2.	Unit 2: Self-management Skills – IV	25
3.	Unit 3: Information and Communication Technology Skills - IV	20
4.	Unit 4: Entrepreneurial Skills – IV	25
5.	Unit 5: Green Skills – IV	15
	Total	**110**

UNIT 1: COMMUNICATION SKILLS – IV			
Learning Outcome	**Theory (10 hrs)**	**Practical (15 hrs)**	**Duration (25 hrs)**
1. Describe the steps to active listening skills	1. Importance of active listening at workplace 2. Steps to active listening	1. Demonstration of the key aspects of becoming active listener 2. Preparing posters of steps for active listening	10
2. Demonstrate basic writing skills	2. Writing skills to the following: • 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	15
		Total	**25**

UNIT 2: SELF-MANAGEMENT SKILLS – IV			
Learning Outcome	**Theory (10 hrs)**	**Practical (15 hrs)**	**Duration (25 Hrs)**
1. Describe the various factors influencing self-motivation	1. Finding and listing motives (needs and desires); 2. Finding sources of motivation and inspiration (music, books, activities);expansive thoughts; living fully in the present moment; dreaming big	1. Group discussion on identifying needs and desire 2. Discussion on sources of motivation and inspiration	10
2. Describe the basic personality	1. Describe the meaning of personality	1. Demonstrate the knowledge of different personality types	15

traits, types and disorders	2. Describe how personality influences others 3. Describe basic personality traits 4. Describe common personality disorders- paranoid, antisocial, schizoid, borderline, narcissistic, avoidant, dependent and Obsessive		
		Total	**25**

UNIT 3: INFORMATION AND COMMUNICATION TECHNOLOGY SKILLS - IV			
Learning Outcome	**Theory (06 hrs)**	**Practical (14 hrs)**	**Duration (20 Hrs)**
1. Perform tabulation using spreadsheet application	1. Introduction to spreadsheet application 2. Spreadsheet applications 3. Creating a new worksheet 4. Opening workbook and entering text 5. Resizing fonts and styles 6. Copying and moving 7. Filter and sorting 8. Formulas and functions 9. Password protection. 10. Printing a spreadsheet. 11. Saving a spreadsheet in various formats.	1. Demonstration and practice on the following: • Introduction to the spreadsheet application • Listing the spreadsheet applications • Creating a new worksheet • Opening the workbook and enter text • Resizing fonts and styles • Copying and move the cell data • Sorting and Filter the data • Applying elementary formulas and functions • Protecting the spreadsheet with password • Printing a spreadsheet • Saving the spreadsheet in various formats.	10
2. Prepare presentation using presentation application	1. Introduction to presentation 2. Software packages for presentation 3. Creating a new presentation 4. Adding a slide	1. Demonstration and practice on the following: • Listing the software packages for presentation	10

	5. Deleting a slide 6. Entering and editing text 7. Formatting text 8. Inserting clipart and images 9. Slide layout 10. Saving a presentation 11. Printing a presentation document.	• Explaining the features of a presentation • Creating a new presentation • Adding a slide to the presentation. • Deleting a slide • Entering and editing text • Formatting text • Inserting clipart and images • Sliding layout • Saving a presentation • Printing a presentation document	
		Total	**20**

UNIT 4: ENTREPRENEURIAL SKILLS - IV			
Learning Outcome	**Theory (10 hrs)**	**Practical (15 hrs)**	**Duration (25 Hrs)**
1. Identify the general and entrepreneurial behavioral competencies	1. Barriers to becoming an entrepreneur 2. Behavioral and entrepreneurial competencies – adaptability/ decisiveness, initiative/perseverance, interpersonal skills, organizational skills, stress management, valuing service and diversity	1. Administering self- rating questionnaire and score responses in each of the competencies 2. Collect small story/ anecdote of prominent successful entrepreneurs 3. Identify entrepreneurial competencies reflected in each story and connect it to the definition of behavioral competencies 4. Preparation of competency profile of students	10
2. Demonstrate the knowledge of self-assessment of behavioral competencies	1. Entrepreneurial competencies in particular: self - confidence, initiative, seeing and acting on opportunities, concern for quality, goal setting and risk taking, problem solving and creativity, systematic planning and efficiency, information seeking, persistence, influencing and negotiating, team building	1. Games and exercises on changing entrepreneurial behavior and development of competencies for enhancing self-confidence, problem solving, goal setting, information seeking, team building and creativity	15
		Total	**25**

UNIT 5: GREEN SKILLS - IV			
Learning Outcome	**Theory (05 hrs)**	**Practical (10 hrs)**	**Duration (15 Hrs)**
1. Identify the role and importance of green jobs in different sectors	1. Role of green jobs in toxin-free homes, 2. Green organic gardening, public transport and energy conservation, 3. Green jobs in water conservation 4. Green jobs in solar and wind power, waste reduction, reuse and recycling of wastes, 5. Green jobs in green tourism 6. Green jobs in building and construction 7. Green jobs in appropriate technology 8. Role of green jobs in Improving energy and raw materials uses 9. Role of green jobs in limiting greenhouse gas emissions 10. Role of green jobs, minimizing waste and pollution 11. Role of green jobs in protecting and restoring ecosystems 12. Role of green jobs in support adaptation to the effects of climate change	1. Listing of green jobs and preparation of posters on green job profiles 2. Prepare posters on green jobs.	15
		Total	**15**

Part B–Vocational Skills

S. No.	Units	Duration (Hrs)
1.	Unit 1: Use of Engine in Agriculture Machinery	30
2.	Unit 2: Land Leveling /Shaping Machine	15
3.	Unit 3: Power Tiller	30
4.	Unit 4: New Technology and Future of Agriculture Machinery	60
5.	Unit 5: Custom Hiring of Agricultural Machinery	30
	Total	**165**

UNIT 1: USE OF ENGINE IN AGRICULTURE MACHINERY			
Learning Outcome	**Theory (12 hrs)**	**Practical (18 hrs)**	**Duration (30 Hrs)**
1. Able to describe and handle the engine	1. Use of engine in agricultural applications 2. Working principle of engine - Two stroke/ four stroke - CI/ SI engine 3. Components of engine 4. Study of various system of engine such as air intake, cooling, fuel supply, lubrication and governing 5. Trouble shooting in engine operation 6. Minor repair and maintenance 7. Tools for repair and maintenance 8. Standard procedure for attaching engine with various agriculture machinery as per manual	1. Make a list of different types engine used for agriculture purpose 2. Differentiate between Two stroke and four stroke 3. Differentiate between CI/ SI engine 4. Identify the components of engine 5. Preventive maintenance of engine 6. Practice of starting the engine 7. Make list of Tools used for repair and maintenance 8. Reading the manual and attaching the engine with agriculture machinery	30
		Total	**30**

UNIT 2: LAND LEVELING/ SHAPING MACHINE			
Learning Outcomes	**Theory (05 Hrs)**	**Practical (10 Hrs)**	**Duration (15 Hrs)**
1. Identify, describe and working of different types of land leveling/ shaping equipments	1. Importance of land leveling/ shaping 2. Types of land leveler - Terracer Blade - Scraper - Laser land leveler - Dozer and Back hoe Constructional features, selection, adjustments, periodical maintenance, operational techniques, guidelines for safety in operation, off seasonal storage	1. Identify the parts of Terracer Blade, Scraper, Laser land leveler, Dozer and Back hoe 2. Make the sketches of Terracer Blade, Scraper, Laser land leveler, Dozer and Back hoe 3. Practice on attaching of laser leveler and tractor 4. Practice of operational techniques 5. Make a list of safety guidelines and tips during operation 6. Make a list of off seasonal storage of leveling equipments	15
		Total	**15**

UNIT 3: POWER TILLER			
Learning Outcomes	**Theory (10 Hrs)**	**Practical (20 Hrs)**	**Duration (30 Hrs)**
1. Able to describe and handle the power tiller	1. Importance and uses of power tiller 2. Constructional detail of power tiller 3. Working principle of power tiller 4. Make, models and sizes of power tiller 5. Selection of power tiller 6. Adjustments, preventive maintenance 7. Operating techniques of power tiller in case puddling, seeding and planting, Interculture, plant protections, harvesting, material handling and transportation 8. Periodical maintenance and trouble shooting	1. Identify the parts of power tiller 2. Make the sketches of power tiller 3. Practice of operational techniques 4. Make a list of safety guidelines and tips during operation 5. Make a list of off seasonal storage of power tiller	30
		Total	**30**

UNIT 4: NEW TECHNOLOGY AND FUTURE OF AGRICULTURE MACHINERY			
Learning Outcomes	**Theory (25 Hrs)**	**Practical (35 Hrs)**	**Duration (60 Hrs)**
1. Able to describe the features of Pneumatic Planter	1. Pneumatic Planter Constructional features, selection, adjustments, periodical maintenance , operational techniques, guidelines for safety in operation, off seasonal storage	1. Identify the parts of Pneumatic Planter 2. Make the sketches of Pneumatic Planter 3. Practice of operational techniques 4. Make a list of safety guidelines and tips during operation 5. Make a list of off seasonal storage of Identify the parts of Pneumatic Planter 6. Make the sketches of Pneumatic Planter 7. Practice power tiller operations with matching implements 8. Make a list of safety guidelines and tips during operations 9. Make a list of off seasonal storage of Pneumatic Planter	12
2. Able to explain the features of power weeder and Mulche**r**	1. Power weeder, mulcher Constructional features, selection, adjustments, periodical maintenance, operational techniques, guidelines for safety in operation, off seasonal storage	1. Identify the parts of Power weeder, mulcher 2. Make the sketches of Power weeder, mulcher 3. Practice of operational techniques 4. Make a list of safety guidelines and tips during operation 5. Make a list of off seasonal storage care for Power weeder, mulcher	12

3. Describe feature of Reaper Binder, Combine harvester, Straw combine and baler	1. Reaper and binder, Combine harvester, Straw combine, Baler Constructional features, selection, adjustments, periodical maintenance , operational techniques, guidelines for safety in operation, off seasonal storage care	1. Identify the parts of Reaper and binder, Combine harvester, Straw combine and Baler 2. Make the sketches of Reaper and binder, Combine harvester, Straw combine and Baler 3. Practice of operational techniques 4. Make a list of safety guidelines and tips during operation 5. Make a list of off seasonal storage care of reaper and binder, Combine harvester, Straw combine and Baler	12
4. Able to explain the features of Solar PV pumps	1. Solar PV pumps Constructional features, selection, adjustments, periodical maintenance , operational techniques, guidelines for safety in operation, off seasonal storage care	1. Identify the parts of Solar PV pumps 2. Make the sketches of Solar PV pumps 3. Practice of operation and care of Solar PV pumps 4. Make a list of safety guidelines and tips during operation 5. Make a list of off seasonal storage care of Solar PV pumps	12
5. Able to explain the features of drones	1. Drones Constructional features, selection, adjustments, periodical maintenance , operational techniques, guidelines for safety in operation, off seasonal storage	1. Identify the parts of Drones 2. Make the sketches of Drones 3. Practice of operational techniques 4. Make a list of safety guidelines and tips during operation 5. Make a list of off seasonal storage of Drones	12
		Total	**60**

UNIT 5: CUSTOM HIRING OF AGRICULTURAL MACHINERY			
Learning Outcomes	**Theory (10 Hrs)**	**Practical (20 Hrs)**	**Duration (30 Hrs)**
1. Able to explain the custom hiring	1. What is custom hiring? 2. Benefits of custom hiring 3. Selection of machines for custom hiring 4. Components of cost analysis for custom hiring 5. Calculation of rates for custom hiring - Calculation of fixed cost - Calculation of variable cost - Calculation of payback period - Calculation of breakeven point 6. Government/bank schemes for promotion of custom hiring 7. Guidelines for starting custom hiring 8. Report preparation for custom hiring	1. Make a list of benefits of custom hiring 2. Calculation of operational cost of tractor 3. Calculation of operational cost of power tiller 4. Calculation of operational cost of Rotavator 5. List the agencies involved in facilitating custom hiring centers 6. List the government schemes/bank for custom hiring 7. List the guideline for starting custom hiring 8. Make a report of custom hiring	30
		Total	**30**

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 an agricultural field with agriculture machinery . During the visit, students should obtain the following information from the owner or the supervisor of the farm:

1. Area under agriculture machinery
2. Manpower engaged
3. Operation and maintenance of agriculture machinery
4. Total expenditure incurred in repair and maintenance
5. Any other information

7. LIST OF EQUIPMENT AND MATERIALS

The tools, equipment and materials required for training are quite expensive, therefore; 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. In this training programme, regular field visits should be organised to provide opportunities to the students/trainees for observation and hands-on practice.
The following tools and equipment are required for the installation of Agriculture Machine Operator.

- Open end spanner set
- Ring end spanner set
- Socket spanner set
- Allen key set
- Wrenches
- Plier
- Screw driver set
- Hammer
- Punches
- File set
- Combination set
- Steel scale
- Measuring tape
- Torque wrench
- Wheel jack
- Tachometer
- Multimeter
- Stop watch
- Battery charger
- Oil cane
- Grease gun
- Hydrometer
- Battery
- Tyre pressure gauge
- Cell tester
- Line tester
- Soldering kit
- Circlip pliers
- Chain wrench
- Pipe wrench
- Pressure gauge
- Chisel set

Agriculture machine equipments:

- Tractor
- MB Plough
- Disc plough
- Cultivator
- Disc harrow
- Rotavator
- Seed cum fertilizer
- Power tiller
- Battery operated sprayer
- Manual fertilizer broadcaster
- Manual transplanter
- Manual dibbler

Small tool:

- Grass cutter
- Sickle
- Spade
- Hand hoe (Khurpi)
- Axe
- Trowel
- Pickaxe
- Manual weeder

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.	Degree in Agricultural Engineering or Mechnical Engineering from a recognized Institute /University, with at least 1 year work / teaching experience Or Diploma in Agricultural Engineering or Civil Engineering from a recognized Institute /University, with at least 3 year work / teaching experience	• 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 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 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:

(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

S.No.	Name and Designation	Residential/Office address	Contact number	Email ID
1.	Dr. Manoj Mathew Professor (FPME)	Professor (FPME), Rice Research Station Moncompu, Alleppey, Kerala-688503	9447939705	mathewmanoj@gmail.com
2.	Prabhat Kumar Verma Retired Assistant Commissioner	Olive 261, Ruchi Life, Jatkhedi, Hoshangabad Road, Bhopal - 462026	7974717386	pkverma00@gmail.com
3.	Jay Prakash Lall Executive Director	AFC India Ltd., Block I/107A, Kirti Nagar, New Delhi- 110015	9987293500	Jplall.afc@gmail.com
4.	Dr. Uday R. Badegaonkar Principal Scientist	Central Institute of Agricultural Engineering, Nabi Bagh, Berasiya Road, Bhopal - 462038	9575509305	udayrb65@gmail.com
5.	Dr. Satyendra Thakur Consultant	Department of Engineering and Technology, PSS Central Institute of Vocational Education, Shyamla Hills, Bhopal, M.P.	8319805807	thakursatyendra007@gmail.com
6.	Er. Kuber Singh Consultant	Department of Engineering and Technology, PSS Central Institute of Vocational Education, Shyamla Hills, Bhopal, M.P.	9131403920	kuber.nitttr@gmail.com
7.	Dr. Saurabh Prakash Professor and Programme Coordinator	Department of Engineering and Technology, PSS Central Institute of Vocational Education, Shyamla Hills, Bhopal, M.P.	9425301901	saurabhp60 @gmail.com

PSS CENTRAL INSTITUTE OF VOCATIONAL EDUCATION
Shyamla Hills, Bhopal- 462 013, M.P., India