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Ministry of Labor and Skills

Farm Machinery and Equipment Mechanics

Level – I

TVET Curriculum Version-I

Based on March 2022, Version- II Occupational Standard

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Addis Ababa, Ethiopia

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Preface

The reformed TVET-System is an outcome-based system. It utilizes the needs of the labor market and occupational requirements from the world of work as the benchmark and standard for TVET delivery. The requirements from the world of work are analyzed and documented – taking into account international benchmarking – as occupational standards (OS).

In the reformed TVET-System, curricula and curriculum development play an important role with regard to quality driven comparable TVET-Delivery. The Curricula help to facilitate the training process in a way, that trainees acquire the set of occupational competences (skills, knowledge and attitude) required at the working place and defined in the occupational standards (OS).

This curriculum has been developed by a group of professional experts from different Regional TVET Bureaus, colleges, Industries, Institutes and universities based on the occupational standard for **Agricultural Machinery and Equipment Mechanics Level I**. The curriculum development process has been actively supported and facilitated by **Ministry of Labor and Skills.**

1 TVET-Program Design

1.1 TVET-Program Title*:* Agricultural Machinery and Equipment Mechanics Level I

1.2 TVET-Program Description

The Program is designed to develop the necessary knowledge, skills and attitude of the trainees to the standard required by the occupation. The contents of this program are in line with the occupational standard. The Trainees who successfully completed the Program will be qualified to work as **Agricultural Machinery and Equipment Mechanics worker** with competencies elaborated in the respective OS. Graduates of the program will have the required qualification to work in the **Agriculture Sector** in the field of **Agricultural Machinery and Equipment Mechanics.**

The prime objective of this training program is to equip the Trainees with the identified competences specified in the OS. Graduates are therefore expected to; Use and Maintain workshop Tools and equipment, Sketch and Interpret Working Drawings, Perform Bench Work, Remove and Tag Electrical/Electronic Units/Assemblies, Test, Service and Maintain Storage Battery Systems, Remove and Tag Steering, Suspension and Brake System Components, Remove and Tag Engine System Components, Remove and Tag Power Train System Components, Service and Repair Tyres and Tubes, Apply Agricultural Extension Communication, Apply Basics of Human Nutrition Practices, Implement Agribusiness Marketing and Apply 5S Procedures in accordance with the performance criteria and evidence guide described in the OS.

1.3 Training Program Structure

Unit of Competence		Module Code & Title		Learning Outcomes	Duration (In Hours)
AGR MEM1 01 0322	**U**se and Maintain workshop Tools and equipment	AGRMEM1M01 0922	Using and Maintaining work shop tools and equipment	• Identify workshop tools and Prepare work station • Carry out measurements • Use tools and Equipment • Maintain tools and Equipment	54
AGR MEM1 08 0322	Sketch and Interpret Working Drawings	AGR MEM1 M02 0922	Sketching and Interpreting Working Drawings	• Identify basic technical drawing • Carry out line, views and standard symbols • Interpret technical drawing	30

AGR MEM1 02 0322	Perform Bench Work	AGR MEM1 M03 0922	Performing Bench Work	• Read, Lay-out and mark dimensions/ features on work piece • Perform Cutting, chipping and filling • Conduct Drilling, grinding, ream and lapping holes • Perform Cutting threads using tap and die • Carryout sheet metal cutting and bending • Conduct Scraping and honing holes	60
AGR MEM1 04 0322	Remove and Tag Electrical/Electronic Units/Assemblies	AGR MEM1 M04 0922	Removing and Tagging Electrical/Electronic Units/Assemblies	• Prepare to remove and tag electrical/ electronic components • Remove electrical /electronic system components • Tag electrical/ electronic components • Carry out re-assembly works	60
AGR MEM1 03 0322	Test, Service and Maintain Storage Battery Systems	AGR MEM1 M05 0922	Testing, Servicing and Maintaining Storage Battery Systems	• Prepare to undertake battery inspection • Conduct inspection • Carry out service and maintenance • Clean up work area and maintain Equipment	30

AGR MEM1 07 0322	Remove and Tag Steering, Suspension and Brake System Components	AGR MEM1 M06 0922	Removing and Tagging Steering, Suspension and Brake System Components	• Prepare to remove and tag steering, suspension and brake system components • Remove steering, suspension and brake system components • Tag steering, suspension and brake system components • Re-assemble Steering, Suspension and Brake System Components	45
AGR MEM1 06 0322	Remove and Tag Engine System Components	AGR MEM1M07 0322	Removing and Tagging Engine System Components	• Prepare to remove and tag engine system components • Remove and Tag engine system • Re assemble engine system components	80

AGR MEM1 05 0322	Remove and Tag Power Train System Components	AGR MEM1 M08 0922	Removing and Tagging Power Train System Components	• Prepare to remove and tag power train system assembly • Remove power train system assembly • Tag power train system assembly • Carry out re-assembly works	120
AGR MEM1 09 0322	Service and Repair Tyres and Tubes	AGR MEM1M09 0922	Servicing and Repairing Tyres and Tubes	• Prepare for tyre servicing • Conduct inspection and analyse results • Carry out removal, repair and refit • Prepare equipment for use or storage	32
AGR MEM 1 13 0322	Apply 5S Procedures	AGR MEM1 M10 0922	Applying 5S Procedures	• Prepare for work. • Sort items. • Set all items in order • Perform shine activities • Standardize 5S • Sustain 5S	30
AGR MEM 1 12 0322	Implement Agribusiness Marketing	AGR MEM1 M11 0922	Implementing Agribusiness Marketing	• Understand concept of agricultural marketing • Understand concepts of agribusiness • Identify marketing targets for Agricultural products • Implement marketing strategy • Establish contract farming • Apply Agricultural marketing services	40

AGR MEM 1 11 0322	Apply Basics of Human Nutrition Practices	AGR MEM1 M12 0922	Applying Basics of Human Nutrition Practices	• Identify Categories of agricultural foods items • Recognize malnutrition in the community • Identify the role of agriculture in nutrition • Demonstrate diversified Agricultural food production and consumption techniques • Perform proper handling and storage of agricultural food products • Document and report food production, consumption and difficulties	50
AGR MEM 1 10 0322	Apply Agricultural Extension Communication	AGR MEM 1 M13 0922	Applying Agricultural Extension Communication	• Understand the Concept and evolution of Agricultural Extension • Apply Extension methods and Approaches • Apply Agricultural Extension Communication and Facilitation for technology promotion • Conduct Training • Record and Document Data	55

1.4 Duration of the TVET-Program

The Program will have duration of **686** hours including the on school/ Institution training and o n-the-job practice or cooperative training time. Such cooperative training based on realities of the industry, nature of the occupation, location of the TVET institution, and other factors will be considered in the training delivery to ensure that trainees acquire practical and workplace experience.

S. No	Module title	TVET Institution training		Cooperative training	Total hours	Remark
		Theory	Practical			
1.	**U**sing and Maintaining workshop Tools and equipment	16	34	4	54	
2.	Sketching and Interpreting Working Drawings	10	20	0	30	
3.	Performing Bench Work	20	30	10	60	
4.	Removing and Tagging Electrical/Electronic Units/Assemblies	15	35	10	60	
5.	Testing, Servicing and Maintaining Storage Battery Systems	8	20	2	30	
6.	Removing and Tagging Steering, Suspension and Brake System Components	10	30	5	45	
7.	Removing and Tagging Engine System Components	20	40	20	80	
8.	Removing and Tagging Power Train System Components	30	80	10	120	
9.	Servicing and Repairing Tyres and Tubes	8	20	4	32	
10.	Applying Agricultural Extension	18	10	2	30	

	Communication					
11.	Applying Basics of Human Nutrition Practices	20	14	6	40	
12.	Implementing Agribusiness Marketing	25	20	5	50	
13.	Applying 5S Procedures	30	20	5	55	
Total hour		**230**	**373**	**83**	**686**	

1.5 Qualification Level and Certification

Qualification is a formal certificate issued by an official agency in recognition to that an individual has been assessed as achieving learning outcomes or competencies to the standard specified for the qualification title. A qualification confers official recognition of value in the labour market and in further education and training. Based on the descriptors elaborated on the Ethiopian National TVET Qualification Framework (NTQF) the qualification of this specific TVET Program is **Certificate I** according to the level. The trainee will be awarded transcript and the institutional certificate after successfully completing all the modules in the level.

1.6 Target Groups

Any citizen who meets the entry requirements under items 1.7 and capable of participating in the training activities is entitled to take part in the Program.

1.7 Entry Requirements

In principle everyone should be able to access training based on the labor market. Hence the prospective participants of this program are any citizens who possess the entry requirement directive of the Ministry of Labor and Skills.

1.8 Mode of Delivery

This TVET-Program is characterized as a formal Program on middle level technical skills. The mode of training delivery is in the institution and co-operative training. Cooperative training is a model of training by the cooperation of enterprises/industries and TVET institutions whereby trainees spend much of their time in the enterprises/industries to acquire industrial knowledge, skills, experiences, and

attitudes of the industrial environment and the remaining time in TVET institutions to acquire basic skills and theoretical concepts. Therefore, it is necessary to make the TVET sector more effective by strengthening a system of cooperative training accepted by the industry.

The program will employ different alternatives of cooperative training such as apprenticeships, internship and traineeship based on the nature of the occupation, location of the TVET institutions, and interest of the industry. In addition, in the areas where industry is not sufficiently available the established production and service centers/learning factories in TVET institutions will be used as cooperative training places. The Training-Institution and identified companies should have to take an agreement to co-operate with regard to the implementation of this program.

1.9 Institutional Assessment

Two types of evaluation will be used in determining the extent to which training outcomes are achieved. The specific training outcomes are stated in the modules. In assessing them, verifiable and observable indicators and standards shall be used.

The ***formative assessment*** is incorporated in the training modules and form part of the training process. Formative evaluation provides the trainee with feedback regarding success or failure in attaining training outcomes. It identifies the specific training errors that need to be corrected, and provides reinforcement for successful performance as well. For the teacher, formative evaluation provides information for making instruction and remedial work more effective.

Summative Evaluation the other form of evaluation is given when all the modules in the program have been accomplished. It determines the extent to which competence have been achieved. And, the result of this assessment decision shall be expressed in the term of institutional Assessment implementation guidelines.

Techniques or tools for obtaining information about trainees' achievement include oral or written test, demonstration and on-site observation. Therefore, a trainee is required to earn at least 60% to be theoretically qualified. This result should be 18% or more when converted to 30%. Regarding performance appraisal results, it must score at least 80% or at least 32% or more when converted to

40%. Must cooperate at least 80% out of 100% in cooperative training; When converted to 30%, it must register 24%.

1.10 TVET Teachers Profile

The trainers conducting this particular TVET Program are **B Level** and above who have satisfactory practical experiences or equivalent qualifications.

1.11 Inclusive training and aassessment methodology

The program is delivered using a variety of training methods. The table below shows training and assessment methodology for non-impaired trainees and with reasonable adjustment for impaired trainees. In addition, as per the nature of the module title the trainer can use recommended and possible training and assessment methodology.

Learning Methods:				
For none impaired trainees	**Reasonable Adjustment for Trainees with Disability (TWD)**			
	Low Vision	**Deaf**	**Hard of hearing**	**Physical impairment**
Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in Audio/video ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format ❖ Summarize main points	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop

Lecture-discussion	❖ Provide large print text ❖ Prepare the lecture in Audio/video ❖ Organize the class room seating arrangement to be accessible to trainees ❖ Write short notes on the black/white board using large text ❖ Make sure the luminosity of the light of class room is kept ❖ Use normal tone of voice ❖ Encourage trainees to record the lecture in audio format ❖ Provide Orientation on the physical feature of the work shop ❖ Summarize main points	❖ Assign sign language interpreter ❖ Arrange the class room seating to be conducive for eye to eye contact ❖ Make sure the luminosity of the light of class room is kept ❖ Introduce new and relevant vocabularies ❖ Use short and clear sentences ❖ Give emphasis on visual lecture and ensure the attention of the trainees ❖ Avoid movement during lecture time ❖ Present the lecture in video format ❖ Summarize main points	❖ Organize the class room seating arrangement to be accessible to trainees ❖ Speak loudly ❖ Ensure the attention of the trainees ❖ Present the lecture in video format ❖ Ensure the attention of the trainees	❖ Organize the class room seating arrangement to be accessible for wheelchairs users. ❖ Facilitate and support the trainees who have severe impairments on their upper limbs to take note ❖ Provide Orientation on the physical feature of the work shop
Demonstration	❖ Conduct close follow up ❖ Use verbal description ❖ Provide special attention in the process of guidance ❖ facilitate the support of peer trainees ❖ Prepare & use simulation	❖ use Sign language interpreter ❖ Use video recorded material ❖ Ensure attention of the trainees ❖ Provide structured training ❖ Show clear and short method ❖ Use gesture ❖ provide tutorial support (if necessary)	❖ Illustrate in clear & short method ❖ Use Video recorded material ❖ Ensure the attention of the trainees ❖ provide tutorial support (if necessary)	❖ Facilitate and support the trainees having severe upper limbs impairment to operate equipments/ machines ❖ Assign peer trainees to assist ❖ Conduct close follow up ❖ provide tutorial support (if necessary

Group discussion	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Brief the thematic issues of the work	❖ Use sign language interpreters ❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member	❖ Facilitate the integration of trainees with group members ❖ Conduct close follow up ❖ Introduce the trainees with other group member ❖ Inform the group members to speak loudly	❖ Introduce the trainees with their peers
Exercise	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/practical training ❖ Introduce new and relevant vocabularies	❖ Conduct close follow up and guidance ❖ Provide tutorial support if necessary ❖ provide special attention in the process/ practical training	❖ Assign peer trainees ❖ Use additional nominal hours if necessary
Individual assignment	❖ prepare the assignment questions in large text ❖ Encourage the trainees to prepare and submit the assignment in large texts ❖ Make available recorded assignment questions ❖ Facilitate the trainees to prepare and submit the assignment in soft or hard copy	❖ Use sign language interpreter ❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	❖ Provide briefing /orientation on the assignment ❖ Provide visual recorded material	

Assessment Methods:				
Interview		❖ Use sign language interpreter ❖ Ensure or conform whether the proper communication was conducted with the trainee through the service of the sign language interpreter ❖ Use short and clear questioning ❖ Time extension	❖ Speak loudly ❖ Using sign language interpreter if necessary	❖ Use written response as an option for the trainees having speech challenges
Written test	❖ Prepare the exam in large texts ❖ Use interview as an option if necessary ❖ Prepare the exam in audio format ❖ Assign human reader ❖ (if necessary) ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, True or False, matching and short answers ❖ Avoid essay writing ❖ Time extension	❖ Prepare the exam using short sentences, multiple choices, true or false, matching and short answers if necessary.	❖ Use oral response as an option to give answer for trainees having severe upper limb impairment ❖ Time extension for trainees having severe

				upper limb impairment
Demonstration /Observation	❖ Brief the instruction or provide them in large text ❖ Time extension	❖ Use sign language interpreter ❖ Brief on the instruction of the exam ❖ Provide activity-based/ practical assessment method ❖ Time extension	❖ Provide activity based assessment ❖ Brief on the instruction of the exam ❖ Use loud voice ❖ Time extension	❖ Provide activity based assessment ❖ Conduct close follow up ❖ Time extension

2. Learning Module Design

Module Code and Title	AGR MEM1 M01 0922: Using and Maintaining Workshop Tools and Equipment
Nominal Duration :	**54 Hours**
Module Description : This module covers the knowledge, skills and attitudes required to Maintain tools and Equipment for use tools and Equipment to carry out measurements and identify workshop tools and Prepare work station	
Learning Outcomes At the end of the module the trainee will be able to: LO-1: Identify workshop tools and prepare work station LO-2: Carry out measurements LO-3: Use of tools and equipment LO-4: Maintain tools and equipment	
Module Contents: **LO-1: Identify workshop tools and prepare work station** 1.1 Personal protective equipment 1.2 Hand tools, power tools, measuring devices and testing device 1.3 Workstation and workshop manual for working activities 1.4 Work place procedures for tools and equipment 1.5 Checking a functionality of device, tools and equipment 1.6 Unsafe and faulty tools and equipment 1.7 OHS measures and warnings **LO-2: Carry out measurements** 2.1 Measuring tools and devices 2.2 Checking and adjusting measuring tools and device 2.3 Methods of conducting measurement and handling instrument according to procedure 2.4 Comparing measurement results with manufacturer 2.5 Documentation of the results	

LO3: Use tools and equipment

3.1 Using of tools and measuring equipment

3.2 Observe all safety procedures and using appropriate personal protective equipment

3.3 Handling of tools and equipment and reporting malfunctions, unplanned or unusual events

LO-4: Maintain tools and equipment

4.1 Routine maintenance of tools, equipment and measuring device

4.2 Maintenance of hand tools, power tools, measuring devices and Equipment (RS)

4.3 Carryout test and measurement

4.4Cleaning and storage of tools and equipment

Learning Methods

- Lecture
- Image and video showing
- Group discussion
- Demonstration
- Assignments
- Exercise

Assessment methods

- Written test
- Oral questioning
- Quiz
- presentation
- Practical demonstration

Assessment criteria:

LO-1: Identify workshop tools and prepare work station

- Personal protective equipment needs are identified
- Hand tools, power tools and measuring devices are identified
- Workstation is made ready and Procedures and information such as workshop manuals and specifications are acquired for work activities
- Tools and equipment are identified in accordance with workplace procedures and manufacturer specifications
- Identified/selected testing devices, tools and equipment are checked for functionality and made ready for use.
- Unsafe or faulty tools and equipment including measuring tools are identified.
- OHS measures and warnings in relation to working with tools and equipment are observed throughout the work operation

LO-2: Carry out measurements

- Measuring tools/devices are selected in line with job requirements
- Measuring/testing devices are checked and adjusted as needed in accordance with work requirements
- Appropriate method of conducting measurements and measuring instruments are handled without damage and according to workplace procedures and manufacturer specifications.
- Measurement results are compared with manufacturer specifications, and also documented with evidence and supporting information and recommendation

LO-3: Use tools and equipment

- Tools and measuring equipment are used according to tasks undertaken
- All safety procedures in using tools and Equipment are observed at all times and appropriate Personal Protective Equipment (PPE) is used.
- Malfunctions, unplanned or unusual events are reported to the supervisor

LO-4: Maintain tools and equipment

- Routine maintenance of tools is undertaken according to standard operational procedures, principles and techniques.
- Equipment and tools are cleaned before and after use in accordance with manufacturer's instructions
- Tools and equipment are stored safely in appropriate locations in accordance with manufacturer's specifications or standard operating procedures

Module Code and Title	AGR MEM1M02 0922: Sketching and interpreting Working Drawings
Nominal Duration :	30 Hours

Module Description : This module covers the knowledge, attitude and skill required to carry out read and interpret drawings and sketches. It requires interpretations of standard drawings by using symbols, dimensional tolerances and notations

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Identify basic technical drawing

LO-2 Carry out line, views and standard symbols

LO-3 Interpret technical drawing

Module Contents:

LO-1: Identify basic technical drawing

1.1 Safe work practices and procedures

1.2 Drawing instruments

1.3 Drawing technique

1.4 Uses of the alphabet of lines

1.5 Checking drawing

1.6 Identifying views, standard symbols and lines

1.7 Projections

1.8 Dimensioning technique

1.9 Following and confirming instructions

LO-2 Carry out line, views and standard symbols

2.1 Objects represented in the drawing

2.2 Relationship between the views contained in the drawing

2.3 Orthographic and isometric drawing

2.4 Sectional view

2.5 Projections codes and symbols

LO-3 Interpret technical drawing 3.1 Recognizing component, assembly or object 3.2 Reading, interpreting information on the drawing 3.3 Drawing symbols and codes 3.4 Dimensions and material requirements 3.5 Dimensional tolerances, notations
Learning Methods:
• Lecture • Group discussion • Demonstration • Video showing • Exercise • Individual assignment
Assessment Methods:
• Written test/Interview • Oral questioning • Practical demonstration/Observation

Assessment Criteria:
LO-1: Identify basic technical drawing • Drawing instruments identified and prepared according to the requirement. • Drawing is checked and validated against job requirements • Drawing version is checked and validated • Identify views, standard symbols and lines • Instructions are confirmed and followed as required **LO-2: Carry out line, views and standard symbols** • Orthographic and isometric drawing are carried out • Orthographic and isometric views are explained • Sectioned view implemented. • Uses of the alphabet of lines are explained • Projections codes and symbols are correctly identified and explained according to drawing standards **LO-3: Interpret technical drawing** • Component, assembly or object is recognized as required • Drawing symbols and codes are interpreted appropriately • Dimensions and material requirements interpreted. • Dimensional tolerances, notations are interpreted according to specifications

Module Code and Title	**AGR MEM1 M03 0922: Performing Bench Work**
Nominal Duration :	**60 hrs.**

Module Description : This module covers the competences required to determine job requirements, perform basic bench work operations (i.e. layout ; measuring, cutting ; chiseling, grinding, filing ; drilling ; tapping etc.) and check the components for conformance to specifications.

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Read, Lay-out and mark dimensions/ features on work piece

LO-2 Perform Cutting, chipping and filling

LO-3 Conduct Drilling, grinding, ream and lapping holes

LO-4 Perform Cutting threads using tap and die

LO-5 Carryout sheet metal cutting and bending

LO-6 Conduct Scraping and honing holes

Module Contents:

LO-1 Read, Lay-out and mark dimensions/ features on work piece

1.1 OHS requirements and personal protection equipment

1.2 Using measuring instruments

1.3 Scales, Percentages and ratios and Conversion of units

1.4 Geometrical tolerances

1.5 Working drawing and dimensions

1.6 Engineering properties

1.7 Selecting materials

1.8 Bench work tools and equipment.

1.9 Lay-outing and marking dimension/features

LO-2 Perform Cutting, chipping and filling

2.1 work holding devices

2.2 Using appropriate marking and measuring tools and devices

2.3 Cutting speed and machine adjustments

2.4 Cutting. Chipping and filing Work pieces

2.5 Replacing broken or dull cutters

2.6 Bench work operations

2.7 demonstrating, inspecting and testing final works

LO-3 Conduct Drilling, grinding, ream and lapping holes

3.1 Drilling, reaming, spot-facing and lapping hole

3.2 Grinding operations

3.3 Lapping/flushing agent

LO-4 Perform Cutting threads using tap and die

4.1 Type of thread

4.2 Cutting thread in accordance with the recommended tapping sequence.

4.3 Demonstrating, inspecting and checking final works

LO-5 Carryout sheet metal cutting and bending

5.1 Type scrapers

5.2 Cutting operation

5.3 Sharping cutter

5.4 Cutting and bending by applying safety procedures

LO-6 Conduct Scraping and honing holes

6.1 Scraping and honing Work pieces

6.2 Honing flushing agent.

6.3 Honing and ridging holes

6.4 Honing cut edges

6.5 Grounding cutters using appropriate cooling agents.

6.6 Cutting tool grinding

Learning Methods:
• Lecture • Assignment • Exercise • Image and video showing • Group discussion • Demonstration • Brainstorming
Assessment Methods:
• Written test • Oral questioning • Practical demonstration

Assessment Criteria:

LO-1 Read, Lay-out and mark dimensions/ features on work piece

- OHS requirements and personal protection equipment are applied and observed.
- Working drawing and dimensions are accessed and read
- Materials are selected according to the requirements specified in the working drawing.
- Dimensions/features are laid out and marked in accordance with drawing specifications using bench work tools and equipment.
- Lay-outing and marking are performed and applied.

LO-2 Perform Cutting, chipping and filling

- The required bench work tools are identified
- Work pieces (blocks) are clamped in work holding devices to avoid damage and accidents.
- Appropriate marking and measuring tools and devices are used
- Work pieces are cut, chipped or filed to within tolerance specified in the drawing.
- Broken or dull cutters (hacksaw blades, files) are replaced according to requirements
- Bench work operations are performed safely
- Final works are demonstrated, inspected and tested to specified working drawing tolerance.

LO-3 Conduct Drilling, grinding, ream and lapping holes

- Hole is drilled, reamed, spot-faced and lapped to drawing specification.
- Drilling, reaming or lapping holes are performed according to recommended sequence.
- are performed according working requirement
- Lapping/flushing agent is selected and applied according to the requirements of operation.
- Reaming holes are carried out
- Operations are performed applying safety procedures

LO-4 Perform Cutting threads using tap and die

- Thread is cut to fit gage or mating screw, within tolerance given in drawing.
- Thread is cut in accordance with the recommended tapping sequence.
- Thread cutting operations are performed applying safely.
- Final works are demonstrated, inspected and checked to specified working drawing tolerance

LO-5 Carryout sheet metal cutting and bending

- Scrapers are selected according to requirements of operation for sheet metal marking
- Cutting operation are applied based on drawing
- Cutter is sharpened to conform to specifications.
- Bending is performed with appropriate measurement and equipment.
- Cutting and bending is performed by applying safety procedures.

LO-6 Conduct Scraping and honing holes

- Work pieces are scraped and honed according to drawing specifications
- Honing flushing agent is selected and applied according requirements of operation.
- Honing and ridging holes are carried out
- Cut edges are honed and free of burrs.
- Cutters are ground using appropriate cooling agents.
- Cutting tool grinding is performed applying safety procedures and using personal protective devices

Module Code and Title	**AGRMEM1 M04 0922:** **Removing and Replacing Electrical/Electronic Units/Assemblies**
Nominal Duration :	**60 hours**

Module Description : This module covers the knowledge, attitude and skill required to carry out re-assembly works, tag electrical/ electronic components, remove electrical /electronic system components and prepare to remove and tag electrical/ electronic components

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Prepare to remove and tag electrical/ electronic components

LO-2 Remove electrical /electronic system components

LO-3 Tag electrical/ electronic components

LO-4 Carry out re-assembly works

Module Contents:

LO-1 Prepare to remove and tag electrical/ electronic components

1.1 Electrical/ electronic components

1.2 Function of each component

1.3 Nature and scope of work and environmental requirements

1.4 OHS, regulatory requirements and personal protection equipment

1.5 Workshop manuals and specifications, and tooling

1.6 Hazard and Emergency procedure

LO-2 Remove electrical /electronic system components

2.1 Safe removal procedures

2.2 Removing and tagging components

2.3 Carry out inspection of components

2.4 Process report

LO-3 Tag electrical/ electronic components

3.1 Tagging procedures

3.2 Tagging materials

3.3 Tagging components 3.4 Implementing report result and documentation **LO-4 Carry out re-assembly works** 4.1 Cleaning and arranging the components 4.2 Assembling Electrical/ electronic components 4.3 Reporting and documentation
Learning Methods:
• Lecture • Group discussion • Demonstration • Video show • Simulation • Exercise • Individual assignment
Assessment Methods:
• Written test/Interview • Oral questioning • Practical demonstration/Observation

Assessment Criteria:

LO-1: Prepare to remove and tag electrical/ electronic components

- Electrical/ electronic components are identified
- Nature and scope of work and environmental requirements identified and confirmed.
- OHS, regulatory requirements and personal protection equipment prepared and applied.
- Workshop manuals and specifications, and tooling sourced.
- Hazard and Emergency procedures identified and followed as per organization's guideline.

LO-2: Remove electrical /electronic system components

- Electrical/electronic components removal according to Safe removal procedures followed
- Components are removed and tagged are implemented
- Components removed without damage.
- Inspection of components carried out.
- Report processed in accordance with enterprise procedures.

LO-3: Tag electrical/ electronic components

- Tagging procedures are performed
- Require tagging materials are identified
- Components are tagged without damage
- Report results and documentation implemented.

LO-4: Carry out re-assembly works

- Cleaning and arranging the components for assembling is applied
- Electrical/ electronic components assembling works in reverse order performed
- Reporting and documentation is implemented

Module Code and Title	**AGR MEM1 M05 0922:** **Testing , Servicing and Maintaining Storage Battery Systems**
Nominal Duration :	**30 hours**

Module Description: This module covers to inspect service and maintain storage battery systems on agricultural machineries and equipment. Work requires individuals to demonstrate judgment and problem-solving skills in managing own work activities and contributing to a productive team environment.

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Prepare to undertake battery inspection

LO-2 Conduct inspection

LO-3 Carry out service and maintenance

LO-4 Clean-up work area and maintain Equipment

Module Contents:

LO-1: **Prepare to undertake battery inspection**

1.1 OHS and environmental regulatory requirements

1.2 Personal protective equipment

1.3 Operating principles and layout of battery storage systems

1.4 Safe operating procedures and information

1.5 Inspection of technical requirements

1.6 Identifying tools and equipment

LO-2: Conduct inspection

2.1 Workplace procedures and manufacturer specifications

2.2 Component inspection methods

2.3 Comparing battery test results

2.4 Documentation and recommendations of inspection results

2.5 Reporting workplace procedures

LO-3: **Carry out service and maintenance**

3.1 Technical and tool requirements for servicing and maintenance

3.2 Implementing and conducting methods for service and maintenance

3.3 Performing battery clean terminal

3.4 Replacing and top-up battery electrolyte

3.5 Applying battery charging and boosting operation

3.6 Adjustment of clamp battery

3.7 Reporting workplace procedures

LO- 4: Clean up work area and maintain Equipment

4.1 Collecting and storing materials for reuse

4.2 Clean, inspect, serviceable equipment and workplace procedures.

4.3 Identifying unserviceable and faults equipment

Learning method

- Lecture
- Exercise
- Brainstorming
- Group discussion
- Video and Image showing
- Demonstration

Assessment Methods:

- Oral questioning
- Quiz
- Written test
- Practical demonstration

Assessment criteria

LO-1: Prepare to undertake battery inspection

- OHS and environmental requirements are identified and confirmed
- Personal protection equipment needs are used throughout the work
- Safe operating procedures and information are sourced
- Technical requirements for inspection are sourced.
- Tools and equipment's are identified and prepared

LO-2: Conduct inspection

- Methods for the conduct of inspection are implemented in accordance with workplace procedures and manufacturer/component supplier specifications.
- Inspection results are compared with manufacturer/ component supplier specifications.
- Battery test results are compared.
- Results are documented with evidence and supporting information and recommendations made.
- Report is made in accordance with workplace procedures.

LO-3: Carry out service and maintenance

- Technical and tool requirements for servicing and maintenance are identified and support.
- Methods for the conduct of service and/or maintenance are implemented.
- Battery pole or terminal Cleaning and refilling is performed.
- Battery electrolyte replaced and top up is performed.
- Battery charging and boosting operation are performed.
- Battery clamp adjustments made during service and/or maintenance.
- Report is made in accordance with workplace procedures.

LO-4: Clean-up work area and maintain Equipment

- Materials that can be reused are collected and stored.
- Waste and scrap are removed following workplace procedures.
- Equipment and work area are cleaned and inspected for serviceable condition in accordance with workplace procedures.

Module Code and Title	AGR MEM1 M06 0922: Removing and Tagging Steering, Suspension and Brake System Components
Nominal Duration :	45 hours

Module Description : This module covers the knowledge, skills and attitude to remove and tag steering, suspension and brake system components. Work involved includes steering, suspension and brake systems on farm machineries and equipment's. Work requires individuals to demonstrate minimal judgment and problem-solving skills in managing own work activities and contributing to a productive team environment.

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Prepare to remove and tag steering, suspension and brake system components

LO-2 Remove steering, suspension and brake system components

LO-3 Tag steering, suspension and brake system components

LO-4 Re-assemble Steering, Suspension and Brake System Components

Module Contents:

LO-1: Prepare to remove and tag steering, suspension and brake system components

1.1 Workplace information sources and procedures

1.2 Steering, suspension and brake System components

1.2.1 Steering, suspension and brake system terminology

1.2.2 Function of each component

1.2.3 Relationship of components to each other

1.3 Nature and scope of work and environment requirements

1.4 OHS requirements, regulatory requirements and personal protection equipment

1.5 Safe operating procedures and information

1.6 Working problem with the removal and tagging of system components

1.7 Emergency procedures

LO-2: Remove steering, suspension and brake system components

2.1. Removal methods/procedures

2.2. Tooling and equipment

2.3. Remove the components

2.4. Process the report

LO-3: Tag steering, suspension and brake system components

3.1 Tagging procedures

3.2 Resource requirements for tagging

3.3 Prepare Tooling and equipment

3.4 Tagging components

LO-4: Reassemble Steering, Suspension and Brake System Components

4.1 Assembling procedures

4.2 Assembling the component

4.3 Preparing system components

4.4 Cleaning work area and final work report

4.5 Work report and document

Learning Methods:

- Lecture
- Exercise
- Group discussion
- Demonstration
- Video showing
- Brainstorming

Assessment Methods:

- Written test
- Oral questioning/Interview
- Practical demonstration
- Assignment

Assessment Criteria:

LO-1: Prepare to Remove and Tag Steering, Suspension and Brake System Components

- Workplace information sources are accessed and procedures strictly adhered.
- System components are identified
- Nature and scope of work and environment requirements are identified and confirmed.
- OHS requirements, including regulatory requirements and personal protection equipment needs are observed throughout the work.
- Safe operating procedures and information such as workshop manuals and specifications, and tooling required, are sourced.
- Method options are analyzed and those most appropriate to the circumstances are selected and prepared.
- Dangers associated working with the removal and tagging of steering, suspension and brake system components are observed.
- Emergency procedures are identified and followed as per organization's guideline.

LO:2: Remove Steering, Suspension and Brake system Components

- Steering, suspension and brake system components for removal are identified.
- Methods for the removal and tagging are implemented in accordance with manufacturer/component supplier specifications.
- Components are removed without damage.
- Report is processed in accordance with workplace procedures.

LO-3: Tag Steering, Suspension and Brake System Components

- Tagging procedures are identified.
- Resource requirements for tagging are identified and support.
- Tooling and equipment is identified and prepared.
- Components are tagged without damage.

LO-4: Reassemble Steering, Suspension and Brake System Components

- Assembling procedures are identified
- Assembling procedure in reverse order is applied

- Components are assembled without damage.
- Steering, Suspension and Brake System Components are prepared for use.
- Cleaned working areas final report works are performed

Module Code and Title	AGR MEM1 M07 0922: Removing and Tagging Engine System Components
Nominal Duration :	80 hours

Module Description : This module covers preparations to remove and tag engine system related components, Remove engine system related components, and assembling works**.** Work requires individuals to demonstrate minimal judgment and problem-solving skills in managing own work activities and contributing to a productive team environment.

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Prepare to remove and tag engine system components

LO-2 Remove and Tag engine system components

LO-3 Re assemble engine **s**ystem components

Module Contents:

LO-1: Prepare to Remove and Tag Engine System Components

1.1 OHS requirements

1.2 Personal protection equipment

1.3 Engine system components

1.4 Engine system operations

1.5 Types of engines and arrangements

1.6 Removing and Tagging requirement

1.7 Clean engine system components and workplace

1.8 Work shop tools and environmental requirements

1.9 Sources of workplace information

1.10 Work sequence and operating procedures

1.11 Emergency procedures

LO-2: Remove and Tag Engine System Components

2.1 Removing and tagging procedures/methods

2.2 Remove engine system component

2.3 Tagging system component

2.4 Reporting workplace procedures

LO-3: Re-assemble Engine System Components

3.1 Assembling procedures

3.2 Assembling Components

3.3 Preparing engine system component

3.4 Cleaning work area

Learning Methods:

- Lecture
- Exercise
- Group discussion
- Demonstration
- video
- Brainstorming

Assessment Methods:

- Written test
- Oral questioning
- Practical demonstration
- Assignment

Assessment Criteria:

LO-1: Prepare to Remove and Tag Engine System Components

- OHS requirements and personal protection equipment are applied and observed.
- Engine system components are identified
- Resource requirements for tagging are identified.
- Clean engine system components and workplace for tagging
- Identify Work shop tools and environmental requirements.
- Workplace information sources are accessed
- Work sequence and operating procedures should be organized; such as workshop manuals and specifications are sourced.
- Engine system components for removal are identified
- Emergency procedures are identified and followed as per organization's guideline.

LO-2: Remove and Tag **Engine System Components**

- Engine system components are removed based on work sequence
- Methods/procedures for the removal and tagging are implemented.
- System components are tagged before and after removal accordingly based on work order
- Components are tagged and removed without damage.
- Report is processed in accordance with workplace procedures

LO-3: Re-assemble Engine System Components

- Assembling procedures are identified
- Assembling procedure in reverse order is applied
- Components are assembled without damage.
- Engine system components are prepared for use.
- Cleaned working areas final report works are performed

Module Code and Title	AGR MEM1 M08 0922: Removing and Tagging Power Train System Components
Nominal Duration :	120 hours

Module Description : This module covers the competence to remove and tag power train assembly. Work involved includes transmissions, drive line, differential and axle of farm machineries component. Work requires individuals to demonstrate minimal judgement and problem-solving skills in managing own work activities and contributing to a productive team environment.

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Prepare to remove and tag power train system assembly

LO-2 Remove power train system assembly

LO-3 Tag power train system assembly

LO-4 Carry out re-assembly works

Module Contents:

LO-1: Prepare to remove and tag power train system assembly

1.1 Workplace information sources

1.2 Occupational health and safety requirements

1.3 Workshop, manuals, specifications and tooling information

1.4 Identifying power train system and function of each component

1.5 Synchronization of components

1.6 Safety for removal and tagging of transmission system

1.7 Identifying emergency procedures

LO-2: Remove power train system assembly

2.1 Methods for the removal of components

2.2 Power train system

2.3 Report procedures

LO-3: Tag power train system assembly

3.1 Applying safety procedures and requirements

3.2 Tagging resource requirement

3.3 Tagging procedures

3.4 Tagging assemblies

3.5 Cleaning and inspecting procedures

3.6 Reporting and documentation

LO-4: Carry out re-assembly works

4.1 Cleaning and arranging the components

4.2 Power train assembling works

4.3 Implement Report and documentation of re-assembly works

Learning Methods

- Lecture
- Exercise
- Group discussion
- Demonstration
- video show
- Brainstorming

Assessment Methods:

- Oral questioning
- Assignment
- Written test
- Practical demonstration

Assessment Criteria
LO-1: **Prepare to remove and tag power train** system assembly • Workplace information sources are accessed • OHS requirements, including regulatory requirements and personal protection needs are applied throughout the work. • Information such as workshop, manuals, specifications and tooling required are sourced. • Power train parts are identified • Accidents associated with working the removal and tagging of transmission system assembly is applied • Emergency procedures are identified and followed as per organization's guideline **LO -2**: **Remove power train system** assembly • Methods for the removal of components are implemented • Power train system assembly is removed without damage • Report is processed in accordance with workplace procedures **LO -3**: **Tag power train system assembly** • Resource requirements for tagging are performed. • Tagging procedures are implemented. • Assemblies are tagged without damage. • Work results are reported and documented **LO- 4: Carry out re-assembly works** • Cleaning and arranging the components for assembling is applied • Power train assembling works in reverse order performed • 4 Reporting and documentation is implemented

Module Code and Title	**AGR MEM1 M09 0922: Servicing and Repairing Tyres andTubes**
Nominal Duration :	**32 hours**

Module Description : This module covers required to remove and refit farm machinery tyres and tubes from rims, inspect tyres and tubes to assess serviceability and carry out tyres and tube repairs. The module includes identification and confirmation of work requirement, preparation for work, removal, repair and fitting of heavy tyres and tubes and completion of work finalization processes, including clean-up and documentation

Learning Outcomes

At the end of the module the trainee will be able to:

LO-1 Prepare for tyre servicing

LO-2 Conduct inspection and analyse results

LO-3 Carry out removal, repair and refit

LO-4 Prepare equipment for use or storage

Module Contents:

LO-1: Prepare for tyre servicing

1.1 Nature and scope of work requirements.

1.2 OHS requirement and Personal Protective Equipment

1.3 Procedures and information

1.4 Tooling, equipment and materials required

1.5 Operating principles of tyre and tube repair equipment

1.6 Technical requirements for repair and fitting of tyres and tubes.

LO-2 Conduct inspection and analyse results

2.1 Inspection works

2.2 Comparing inspection results with manufacturer

2.3 Documenting results

2.4 Preparing the report

LO-3 Carry **out removal, repair and refit**

3.1 Safe operating procedures

3.2 Types and methods of service and repair

3.3 Removal, repair and refit operation.

3.4 Inspection of road wheel assemblies, mounting points and fittings for damage and wear

3.5 Completing findings and recommendations

3.6 Emergency procedures

LO-4 Prepare **equipment for use or storage**

4.1 Repair schedule documentation

4.2 Final inspection to ensure safety features and work in place.

4.3 Cleaning the equipment

4.4 processing job card

Learning Methods:
• Lecture • image and video • Group discussion • Demonstration • Brainstorming • Exercise
Assessment Methods:
• Written test • Oral questioning • Practical demonstration • Assignment

Assessment Criteria:

LO-1: Prepare for tyre servicing

- Nature and scope of work requirements are identified and confirmed
- OHS requirements, including regulatory requirements and Personal Protective Equipment needs are observed throughout the work.
- Procedures and information such as workshop manuals and specifications is prepared.
- Tooling, equipment and materials required are sourced.
- Technical requirements are sourced for repair and fitting of tyres and tubes and support equipment is identified and prepare

LO:2 Conduct inspection and analyses results

- Inspection works are implemented in accordance with workplace procedures.
- Inspection results are compared with manufacturer/ component supplier specifications.
- Results are documented with evidence and supporting information and recommendation(s) made.
- Report is done in accordance with workplace procedures.

LO:3 Carry out removal, repair and refit

- Safe operating procedures are observed and noted during the use of tools/ equipment.
- Types & methods of service and repair are implemented.
- Removal, repair and refit operation are implemented.
- Inspection of road wheel assemblies, mounting points and fittings for damage and wear
- Findings and recommendations are completed in accordance with enterprise procedure
- Emergency procedures are identified and followed as per organization guidelines

LO:4 Prepare equipment for use or storage

- Repair schedule documentation is completed.
- Final inspection is made to ensure safety features are in place.
- Final inspection is made to ensure work is to workplace expectations.
- Equipment is cleaned for use or storage to workplace expectations
- Job card is processed in accordance with workplace procedures

MODULE CODE AND TITLE : AGR MEM1 M10 0922 Applying 5S Procedures

NOMINAL DURATION :30 Hours

MODULE DESCRIPTION : This module covers the knowledge, skills and attitude required to apply 5S techniques to his/her workplace. It covers responsibility for the day-to-day operations of the workplace and ensuring that continuous improvements of Kaizen elements are initiated and institutionalized.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Prepare for work

LO2. Sort items

LO3. Set all items in order

LO4. Perform shine activities

LO5. Standardize 5S

MODULE CONTENTS:

LO1. Prepare for work

1.1 work instructions

1.2 Reading and interpreting job specifications

1.3 OHS requirements

1.4 Preparing and using tools and equipment

1.5 Identifying and checking safety equipment and tools

1.6 Preparing and using Kaizen Board

LO2. Sort items

2.1 Preparing plan

2.2 Following appropriate procedure

2.3 Perform Cleaning activities

2.4 Identifying all items in the workplace

2.4.1. Listing necessary and unnecessary items

2.4.2. Red tag strategy for unnecessary items

2.4.3. Placing unnecessary items in an appropriate place

2.4.4. Recording and quantifying necessary items

2.4.5. Reporting performance results

2.5 Checking necessary items regularly in the workplace

LO3. Set all items in order

3.1 Preparing plan

3.2 Performing general cleaning activities

3.3 Deciding location/layout, storage and indication methods

3.4 Preparing and using tools and equipment for setting in order activities

3.5 Placing items in their assigned locations

3.6 Returning the items to their assigned locations after use

3.7 Reporting performance results using formats

3.8 Check each item regularly in its assigned location and order

LO4. Perform shine activities

4.1. Preparing plan

4.2. Tools and equipment for shinning activities

4.3. Implementing Shine activity

4.4. Reporting performance results

4.5. Conducting regular shining activities

LO5. Standardize 5S

5.1. Planning to standardize 5S activities

5.2. Tools and techniques to standardize 5S based on relevant procedures

5.3. Following checklists and reporting to relevant personnel

5.4. Keeping the workplace to the specified standard

5.5. Avoiding problems by standardizing activities

LO6. Sustain 5S

6.1. Prepare plan

6.2. Tools and techniques to sustain 5S

6.3. Inspecting workplace for compliance to specified standard

6.4. Cleaning up workplace after and before completion

6.5. Identifying situations where compliance to standards is unlike 6.6. Recommending improvements to lift the level of compliance in the workplace 6.7. Following Checklists to sustain and reporting activities to relevant personnel 6.8. Avoiding problems by sustaining activities
LEARNING METHODS:
• Lecture and Discussion • Demonstration • Simulation • Role playing
ASSESSMENT METHODS:
• Written test with Oral questioning • Practical demonstration

ASSESSMENT CRITERIA:

LO.1 Prepare for work

- Work instructions are used to determine job requirements, including method, material and equipment.
- Job specifications are read and interpreted following working manual.
- OHS requirements, including dust and fume collection, breathing apparatus and eye and ear personal protection needs are observed throughout the work.

LO.2 Sort items

- Plan is prepared to implement sorting activities.
- Cleaning activities are performed.
- All items in the workplace are identified following the appropriate procedures.
- Necessary and unnecessary items are listed using the appropriate format.
- Red tag strategy is used for unnecessary items.
- Unnecessary items are evaluated and placed in an appropriate place other than the workplace.
- Necessary items are recorded and quantified using appropriate format.
- Performance results are reported using appropriate formats.
- Necessary items are regularly checked in the workplace.

LO.3 Set all items in order

- Plan is prepared to implement set in order activities.
- General cleaning activities are performed.
- Location/Layout, storage and indication methods for items are decided.
- Necessary tools and equipment are prepared and used for setting in order activities.
- Items are placed in their assigned locations.
- After use, the items are immediately returned to their assigned locations.
- Performance results are reported using appropriate formats.
- Each item is regularly checked in its assigned location and order.

LO.4 Perform shine activities

- Plan is prepared to implement shine activities.
- Necessary tools and equipment are prepared and used for shinning activities.
- Shine activity is implemented using appropriate procedures.
- Performance results are reported using appropriate formats.
- Regular shining activities are conducted

LO.5 Standardize 5S

- Plan is prepared and used to standardize 5S activities.
- Tools and techniques to standardize 5S are prepared and implemented based on relevant procedures.
- Checklists are followed for standardize activities and reported to relevant personnel.
- The workplace is kept to the specified standard.
- Problems are avoided by standardizing activities.

LO6. Sustain 5S

- Plan is prepared and followed to sustain 5S activities.
- Tools and techniques to sustain 5S are discussed, prepared and implemented based on relevant procedures.
- Workplace is inspected regularly for compliance to specified standard and sustainability of 5S techniques.
- Workplace is cleaned up after completion of job and before commencing next job or end of shift.
- Situations are identified where compliance to standards is unlikely and actions specified in procedures are taken.
- Improvements are recommended to lift the level of compliance in the workplace.
- Checklists are followed to sustain activities and report to relevant personnel.
- Problems are avoided by sustaining activities.

MODULE CODE AND TITLE : AGR MEM1 M11 0922

Implementing Agribusiness Marketing

NOMINAL DURATION : 40hours

MODULE DESCRIPTION : This module covers the knowledge, skills and attitude required to Understand concept of agricultural marketing, Understand concepts of agribusiness, Identify marketing targets for Agricultural products, Implement marketing strategy. Establish contract farming, and Apply Agricultural marketing services.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Understand concept of agricultural marketing

LO2. Understand concepts of agribusiness

LO3. Identify marketing targets for Agricultural products

LO4. Implement marketing strategy

LO5. Establish contract farming

LO6. Apply agricultural marketing services

MODULE CONTENTS:

LO1. Understand concept of agricultural marketing

1.1 Concept and importance of agricultural marketing

1.2 Importance of agricultural marketing

1.3 Roles of agricultural market-oriented service

1.4 Principles of agricultural marketing and strategies

1.5 Understanding Marketing mix

1.6 Types of marketing

LO2. Understand concepts of agribusiness

2.1 Concept and importance of agribusiness

2.2 Importance of agricultural marketing

2.3 Roles of agribusiness-oriented service

2.4 Principles and characteristic of agribusiness

2.5 Characteristic of Agribusiness

2.6 Dimension and structures of Agribusiness

LO3. Identify marketing targets for Agricultural products

3.1 Marketing targets

3.2 Approaches of agricultural market

3.3 Market Segment descriptors

3.4 Strategies of agricultural marketing options

3.5 Preparing Business plans

LO4. Implement marketing strategy

4.1 Agricultural marketing functions strategy

4.2 Developing marketing Action plan

4.3 Resource for agricultural marketing

4.4 Implementing Marketing mix

LO5. Establish contract farming

5.1 Concept of contract farming

5.2 Types of contract farming

5.3 Models of Contract farming

5.4 Steps and procedures of contract farming establishments

5.5 Contract farming requirements

5.6 Establishing Contract farming systems

LO6. Apply Agricultural Marketing Services

6.1 Types of Agricultural products

6.2 Conducting need assessment

6.3 Developing Market strategies

6.4 Collecting and organizing Customer feedbacks

6.5 Organizing and documenting data

LEARNING METHODS:

- Lecture and Discussion
- Demonstration
- Role playing

ASSESSMENT METHODS:
• Written test with Oral questioning • Observation/Demonstration with Oral Questioning • Assignment

ASSESSMENT CRITERIA:

LO1. Understand concept of agricultural marketing

- Concept of agricultural marketing is understood for Agricultural marketing
- Importance of agricultural marketing is understood to provide agricultural marketing services
- Roles of agricultural market-oriented service is identified and understood
- Principles of agricultural marketing and strategies are identified and understood
- Marketing mix is understood to implement agricultural marketing activities
- Types of marketing are understood and identified to implement the appropriate marketing services

LO2. Understand concepts of agribusiness

- Concept of agribusiness is understood for Agricultural marketing
- Importance of agribusiness is understood to provide agribusiness services
- Roles of agribusiness-oriented service is identified and understood
- Principles of agribusiness and strategies are identified and understood
- Characteristic of Agribusiness are understood to implement Agribusiness
- Dimension and structures of Agribusiness are understood and distinguished

LO3. Identify marketing targets for Agricultural products

- Marketing targets are identified for Agricultural products and services
- Approaches of agricultural market are understood for agricultural market product and service.
- Segment descriptors are used to display the targets of agricultural market
- Strategic of agricultural marketing options are identified to develop agricultural marketing plan
- Business plans are prepared to perform cost and benefit analysis.

LO4. Implement marketing strategy

- Agricultural marketing functions strategy is designed to perform agriculture business.

- Action plan is developed to implement Agricultural marketing strategies.
- Require resource are identified and coordinated to implement
- Marketing mix is implemented according to the strategy Agricultural

LO5. Establish contract farming

- Concept of contract farming is understood to enhance market-oriented production
- Types of contract farming are identified to select the appropriate approach
- Models of Contract farming are understood and identified
- Steps and procedures of contract farming establishments are identified
- Contract farming requirements are identified and applied based on the organizational standard
- Contract farming systems are established

LO6. Apply Agricultural Marketing Services

- Agricultural products are identified to delivered provided marketing services
- Need assessment is conducted to identify marketing conditions
- Market strategies are developed to implement the Agricultural marketing services
- Customer feedbacks are collected and organized to improve Agricultural marketing services
- Data is organized and documented to report the appropriate body

MODULE CODE and TITLE : AGR MEM1 M12 0922 :

Applying Basics of Human Nutrition Practices

NOMINAL DURATION : 50 hours

MODULE DESCRIPTION : This module covers the knowledge, skill and attitude required to categorize agricultural foods items, recognize malnutrition in the community, identify the role of agriculture in nutrition and contribute to the awareness creation of the community in utilization of agricultural products.

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Identify Categories of agricultural foods items

LO2. Recognize malnutrition in the community

LO3. Identify the role of agriculture in nutrition

LO4. Demonstrate diversified Agricultural food production and consumption techniques

LO5. Perform proper handling and storage of agricultural food products

LO6. Document and report food production, consumption and difficulties

MODULE CONTENTS:

LO1. Identify Categories of agricultural foods items

1.1. Identifying and explaining basic *terminologies and concepts*

1.2. Identifying and explaining *food groups, nutrient and their sources* of balanced diet

1.3. Identifying and describing *origin* and composition of food stuffs

1.4. Identifying and explaining *energy dense* and *nutrient dense* food sources

LO2. Recognize malnutrition in the community

2.1. Identifying and explaining physical signs of malnutrition

2.2. Identifying forms, causes and consequences of *malnutrition*

2.3. Promoting measures to overcome malnutrition and importance of maintenance of adequate and balanced diet

2.4. Making contribution in elders, family heads and women awareness creation programs

LO3. Identify the role of agriculture in nutrition

3.1. Recognizing and promoting the role of agriculture as source of variety foods

3.2. Describing the contribution of agriculture sector in nutrition sensitive intervention

3.3. Identifying and communicating *nutrition sensitive agricultural practices*

LO4. Demonstrate diversified Agricultural food production and consumption techniques

4.1. Identifying and discussing importance of diet diversification with family holds and community

4.2. Identifying and demonstrating techniques of diversified food production

4.3. Assessing and implementing *techniques of enhancing* the nutrient content of family foods

4.4. Identifying Utensils and demonstrating cooking techniques for specific agricultural products

4.5. Selecting and using PPE

4.6. Demonstrating balanced and nutrient dense diet preparation using food stuff ingredients

LO5. Perform proper handling and storage of agricultural food products

5.1. Explaining importance of hygiene for nutrition

5.2. Identifying storage facilities and supporting family holds in construction

5.3. Safely handling and storing Agricultural products

5.4. Demonstrating methods and techniques of safely handling and storing agricultural products

LO6. Document and report food production, consumption and difficulties

6.1. Documenting diversified food production and consumption activities

6.2. Reporting difficulties happened in the processes

LEARNING METHODS:

- Lecture and Discussion
- Démonstration
- Simulation
- Role playing

ASSESSMENT METHODS:

- Interview
- Written Test
- Observation/Demonstration with Oral Questioning

ASSESSMENT CRITERIA:

LO1. Identify Categories of agricultural foods items

- Basic terminologies and concepts in nutrition are identified and explained
- Food groups, nutrient and their sources of balanced diet are identified and explained
- Origin and composition of food stuffs are identified and described
- Energy dense and nutrient dense food sources are identified and explained

LO2. Recognize malnutrition in the community

- Physical signs of malnutrition are identified and explained
- Forms, causes and consequences of malnutrition in different groups of community are identified
- Measures to overcome malnutrition, importance of maintenance of adequate and balanced diet are promoted
- Contribution is made in elders, family heads and women awareness creation programs

LO3. Identify the role of agriculture in nutrition

- The role of agriculture as source of variety foods is recognized and promoted
- The contribution of agriculture sector in nutrition sensitive intervention is described
- Nutrition sensitive agricultural practices are identified and communicated as per the nutrition program guideline

LO4. Demonstrate diversified Agricultural food production and consumption techniques

- Importance of diet diversification is identified and discussed with family holds and community according to the program guideline
- Techniques of diversified food production are identified and demonstrated to farmers and family members
- Techniques of enhancing the nutrient content of family foods are assessed and implemented according to the program guideline and cultural requirements of the rural

community

- Utensils are identified and cooking techniques demonstrated for specific agricultural products
- PPE are selected and used in accordance to OHS requirement and code of ethics
- Balanced and nutrient dense diet preparation is demonstrated using food stuff ingredients

LO5. Perform proper handling and storage of agricultural food products

- Importance of hygiene for nutrition is explained
- Storage facilities are identified and family holds supported in construction.
- Agricultural products are safely handled and stored
- Methods and techniques of safely handling and storing agricultural products are demonstrated in accordance products requirement

LO6. Document and report food production, consumption and difficulties

- Diversified food production and consumption activities are documented
- Difficulties happened in the processes are reported to the respective authorities

MODULE CODE AND TITLE : AGR MEM1 M13 0922 : Applying Agricultural Extension Service

NOMINAL DURATION : 55 Hours

MODULE DESCRIPTION : This module covers the knowledge, skills and attitudes required to understand the Concept and evolution of agricultural Extension, apply extension methods and Approaches, apply Agricultural extension Communication and facilitation for technology promotion, Conduct training and record and document data

LEARNING OUTCOMES

At the end of the module the trainee will be able to:

LO1. Understand the Concept and evolution of Agricultural Extension

LO2. Apply Extension methods and Approaches

LO3. Apply Agricultural Extension Communication and Facilitation for technology promotion

LO4 Conduct Training

LO4 Record and Document Data

LO5 Recording and Documenting Data

MODULE CONTENTS:

LO1. Understanding the Concept and evolution of Agricultural Extension ….

1.1 Understanding the concept of Agricultural extension

1.2 Expressing the evolution and progress of agricultural extension

1.3 Understanding the role of extension in agricultural development

1.4 Determining the importance of Agricultural extension

1.5 Understanding extension planning activities

LO2. Applying Extension methods and Approaches

2.1 Understanding extension methods to provide Extension services

2.2 Understanding extension approaches

2.3 Understanding the importance of extension methods and approaches

2.4 Applying appropriate extension methods and approaches lines

LO3. Applying Agricultural Extension Communication and Facilitation for technology promotion

3.1 Understanding the concept, principle and type of communication

3.2 Identifying, understanding and solving Communication barriers

3.3 Defining elements of extension communication

3.4 Understanding audio visual techniques

3.5 Recommending roles and characteristics of extension communicator

3.6 Understanding the basic concept of facilitation

3.7 Applying the roles and responsibilities of a facilitator

3.8 Understanding conflict resolution skill

3.9 Applying the skills of a facilitator

LO4 Conducting Training

4.1 Conducting need assessment

4.2 Carrying out preparation facilities

4.3 Conducting implementation to capacitate trainees

4.4 Carrying-out evaluation understand the outcome

LO5 Recording and Documenting Data

5.1 Developing data collecting formats

5.2 Collecting and organizing appropriate data

5.3 Documenting and reporting collected and organized data

LEARNING METHODS:
• Lecture and Discussion • Brainstorming • Practical demonstration • Practical exercice • Role playing
ASSESSMENT METHODS :
• Written test • Oral questioning • Practical (group work) • Presentation

ASSESSMENT CRITERIA:

LO.1. Understand the Concept and evolution of Agricultural Extension ….

- **u**nderstand the concept of Agricultural extension
- Express the evolution and progress of agricultural extension
- Understand the role of extension in agricultural development
- Determine the importance of Agricultural extension
- Understand extension planning activities

LO2. Apply Extension methods and Approaches

- understanding extension methods to provide Extension services
- understanding extension approaches
- understanding the importance of extension methods and approaches
- Applying appropriate extension methods and approaches lines

LO3. Apply Agricultural Extension Communication and Facilitation for technology promotion

- Understand the concept, principle and type of communication
- Identify, understand and solve Communication barriers
- Define elements of extension communication
- Understand audio visual techniques to provide Agricultural Extension and communication
- Recommend roles and characteristics of extension communicator
- Understand the basic concept of facilitation
- Apply the roles and responsibilities of a facilitator
- Understand conflict resolution skill
- Apply the skills of a facilitator for communication & technology promotion

LO4 Conduct Training

- Conduct need assessment
- Carry out preparation facilities for the training process
- Conduct implementation to capacitate trainees

- carry-out evaluation understands the outcome

LO5 Record and Document Data

- Develop data collecting formats
- Collect and organize appropriate data
- Document and report Collected and organized data

3. Resource requirements

Item No.	Category/Item	Description/ Specifications	Quantity	Recommended Ratio (Item: Trainee)
A.	**Learning Materials**			
1.	TTLM	TTTLM prepared by the trainer		1:1
2.	Reference Books			
2.1	A Technical Drawing Course for General Education	UNESCO (1989)	5 pcs	1:5
2.2	Advanced Automotive Fault Diagnosis	Tom Denton (BA, MSAE, MIRTE, Cert. Ed.), Second edition, 2006. Associate Lecturer, Open University, UK	5 pcs	1:5
2.3	Agro Tire Retreading Manual	https://vipal.com	5 pcs	1:5
2.4	Auto Repair Guide to Beginner Auto Maintenance & Repair	Jeff Crawford, CrawfordAuto Repair	5 pcs	1:5
2.5	Automobile Mechanical and Electrical Systems	Automotive Technology: Vehicle Maintenance and Repair ,2011 Library of Congress Number: 2011924729 ISBN: 978-0-08-096945-9 , Page 275	5 pcs	1:5
2.6	Automobile Mechanical and Electrical Systems	Tom Denton. Automotive Technology: Vehicle Maintenance and Repair	5 pcs	1:5

2.7	Automobile Mechanical and Electrical Systems	Tom Denton, Elsevier Ltd (2011)	5 pcs	1:5
2.8	Automotive Electrical And Electronic Systems /Classroom Manual/	John F. Kershaw, Ed.D. (Revision Author), James D. Halderman (Series Advisor), Fifth Edition Update, 2007.	5 pcs	1:5
2.9	Automotive Engineering Powertrain, Chassis System and Vehicle Body	David A. Crola, Eimpell, J., Stoll, H. and Betzler, J. Automotive Chassis: Engineering Principles, 9780750650540 (2001 and 2009)	5 pcs	1:5
2.10	Automotive Engines Diagnosis, Repair And Rebuilding	TIM GILLES (Santa Barbara City College Santa Barbara, CA), 6th edition , 2011.	5 pcs	1:5
2.11	Automotive mechanical and Electrical system	Tom Denton. Automotive Technology: Vehicle Maintenance and Repair and Transmission systems and Transmission driveline (2011)	5 pcs	1:5
2.12	Automotive technology – principles, Diagnosis and Service	James D. Halderman, 4th edition, 2012.	5 pcs	1:5
2.13	Automotive Technology Systems Approaches	Jack Erajavec, 5th edition, 2009.	5 pcs	1:5
2.14	Automotive Wiring And Electrical Systems	Tony Candela, Car Tech, Inc.(2009)	5 pcs	1:5
2.15	Basic Electricity & Electronic	Lab-Volt Systems Inc, March 2005	5 pcs	1:5

2.16	Basic Technical Drawing :Student Textbook Grade 12	Amanuel Berhanu and Tolossa Deberie, Kuraz International Publisher (2003)	5 pcs	1:5
2.17	Basic Technical Drawing: Student Textbook Grade 11	Amanuel Berhanu and Tolossa Deberie, Kuraz International Publisher (2003)	5 pcs	1:5
2.18	Basics Technical Drawing Problems	Spencer, Dygdon and Novak, McGraw-Hill (1995)	5 pcs	1:5
2.19	Battery Management Systems	Gregory L.pletty Library of Congress Cataloging-in-Publication Data and Artech House Volume 1 ,2015	5 pcs	1:5
2.20	Classroom Manual for Automotive Electricity And Electronics	Barry Hollembeak, Delmar, Cengage Learning (2011).	5 pcs	1:5
2.21	Classroom Manual for Automotive Suspension & Steering Systems	Don Knowles, 5th edition, 2011.	5 pcs	1:5
2.22	Entrepreneurship and Small Business Management	Hailay Gebretinsae. 2007, Mekelle, Ethiopia.	5 pcs	1:5
2.23	Farm Mechanization Technical Course Handout	Bezabih Y., Prepared for Instructors of Farm Mechanization and Plant Science Department of ATVET Colleges. Power transmission system (July ,2019)	5 pcs	1:5
2.24	Farm Mechanization Technical Course Handout	Bezabih Y., Prepared for Instructors of Farm Mechanization and Plant	5 pcs	1:5

		Science Department of ATVET Colleges, Electrical system page 23.(July,2019)		
2.25	Fundamentals of foods, nutrition of foods, nutrition and diet therapy	Sumati R.Mudambi M.V.Rajagopal 2007 - 5th edition	5 pcs	1:5
2.26	Fundamentals of Modern Manufacturing	4th Edition By Mikell P. Groover,2008	5 pcs	1:5
2.27	How to diagnose and fix everything electronic	Michael Jay Geier, McGraw-Hill Education (2016)	5 pcs	1:5
2.28	Introduction to agricultural extension and rural sociology	DR. J.A. Salawu etal. 2018	5 pcs	1:1
2.29	Introduction to Basic manufacturing processes and workshop technology	Rajender Singh, 1999.	5 pcs	1:5
2.30	Introduction to Human Nutrition	Michael J Gibney, Susan A Lanham-New, Aedin Cassidy and Hester H Vorster 2002, Second Edition	5 pcs	1:5
2.31	Kaizen Definition & Principles In Brief a Concept & Tool For Employees Involvement	THESSALONIKI ,2006	5 pcs	1:5
2.32	Kaizen Definition & Principles In Brief a Concept & Tool For Employees Involvement	THESSALONIKI, 2006	5 pcs	1:5
2.33	Kaizen: The Japanese	Sarah Harvey published in	5 pcs	1:5

	Method for Transforming Habits, One Small Step at a Time.	,2019.		
2.34	Machining fundamental, from basic to advanced techniques	(Directorate of Vocational Education and Training, Maharashtra State, Version 1 2019-20)	5 pcs	1:5
2.35	Manual of Engineering Drawing	Colin H. Simons etal, Elsevier Ltd.(2009)	5 pcs	1:5
2.36	Mechanical Engineering Drawing Workshop	JAIST (1990)	5 pcs	1:5
2.37	Modern Automotive Technology	Rusell K. Transmission system, Differential and drive axle fundamental The Goodheart-Willcox Co., Inc. Tinley Park, Illinois	5 pcs	1:5
2.38	NOS VF01 – Inspect, Repair and Replace Standard Light Vehicle Tyres	Draft Version,Institute of the Motor Industry(2014)	5 pcs	1:5
2.39	Rema Tip Top ortfolio Tyre Repair	Repair Material 2014/2015	5 pcs	1:5
2.40	Specification For Garage Tools & Equipment	Government of Maharashtra ,Directorate of Vocational Education and Training, Maharashtra State (version 1,2019)	5 pcs	1:5
2.41	Specification for garage tools & equipment's	(Directorate of Vocational Education and Training, Maharashtra State, Version 1	5 pcs	1:5

		2019-20)		
2.42	Teach Yourself Electricity and Electronics	Stan Gibilisco, McGraw-Hill (2005).	5 pcs	1:5
2.43	Technical Drawing	Dr. Anwar and Abu-Zarifa (2008)	5 pcs	1:5
2.44	Technical Drawing: Version 1	Unesco-Nigeria Technical & Vocational Education Revitalisation Project-Phase II (December 2008)	5 pcs	1:5
2.45	Technical/Operational Manual		5 pcs	1:5
2.46	The Car Care Book	Ron Haefner, 4th Edition ,High School Columbus, NE, (2010)	5 pcs	1:5
2.47	The Electronics Hand Book	Jerry C. Whitaker, Taylor & Francis Group (2005)	5 pcs	1:5
2.48	Tractor Electrical System	Dr. Von H. Jarrett, Extension Agricultural Engineer, Utah State University is an Equal Opportunity/Affirmative Action Institution.	5 pcs	1:5
2.49	Tractor manuals	Hp (50-120)	5 pcs	1:5
2.50	Vehicle Maintenance and Repair Series Vehicle Maintenance Vehicle Fitting	Jack Hirst, John Whipp	5 pcs	1:5
2.51	Wheels & Tyres Produced	Martin McMahon ,SOLAS 2013	5 pcs	1:5
2.52	Workshop Processes, Practices and Materials	(Author Bruce J. Black, C. Eng., MIEE, Third edition, 2004, ISBN 0 7506 6073 2)	5 pcs	1:5
B.	**Learning Facilities &**			

	Infrastructure			
1.	Class room	31.5 m^2	1	1:25
2.	Workshop	100 m^2	1	1:25
3.	Internet room	100 m^2	1	1:25
4.	Library room	Per section 105 – 180 m^2	1	1:25
5.	Duplication room	20m^2	1	1:25
6.	Simulation laboratory room	100 m^2	1	1:25
7.	Library	Per section 105 – 180 m^2	1	1:25
8.	Drawing room	100 m^2	1	1:25
C.	**Consumable Materials**			
1.	A0 Paper	80gms	1 ream	1:25
2.	A3 Papers	80gms	1 ream	1:25
3.	A4 papers	80gms	5	1:5
4.	Adhesive tagging sticker	min.97*67,7mm, white, printable	Pack	1:25
5.	Binder	A4, vertical Size:23232218mm Nw: 311g Color Random	1 pcs	1:25
6.	Black and whiteboard	(3m*1.2)	5	1:5
7.	CD/DVD	RW	5	1:5
8.	Chalk	White color	1packet	1:25
9.	Cleaning detergents / soap		25pac	1:1
10.	Colors for bench mark Marking	Red color	5pcs	1:5
11.	Drive Type: Manual and Waterproof	5 pcs	1:5	
12.	Eraser	Size: 35*21*10mm	5	1:5
13.	First Aid Kit	Size: 36*27*4.5 cm or customized Material: 600D Packing: polybag and min 65 pcs, incl, wall holder,	5	1:5

		DIN13157		
14.	Flash disc	8 GB	1	1:25
15.	Flip chart	100*70 and 90*60cm	5	1:5
16.	Fuel	Gasoline and diesel fuel	Litter/gallon	1:25
17.	Gear grease lubricant	Weight :50kgtype grease /agent oil, ISO 9001, Fully Synthetic Base Oil	½ kg	1:25
18.	Hi-vis cloths	Yellow color	25 pcs	1:1
19.	Image Data	Ortho photo/ ortho rectified	5 pcs	1:5
20.	Liquid battery Distilled water	for battery use ,ph value 6-7.5	1	1:25
21.	Lubrication oil	SAE 30 & 40	1gallon	1:25
22.	Marker	Reusable	1	1:25
23.	Oil	SAE 10/30/W40	2lit	1:12
24.	Packing	polybag	5 pcs	1:5
25.	Pen	Ballpoint pen	5 pack	1:25
26.	Pencil Sharper	size: 3.7*3.5*1.8cm, weight: 8.5g Material: Plastic Drive Type: Manual and Waterproof	5 pack	1:5
27.	Photocopier ink/toner	Compatible with the existing printer	1pcs	1:25
28.	Plain steel rod, rebar, bar, angle	Type: Carbon Steel Bar, Carbon Steel Bar Tolerance: ±1% Processing Service: Bending, Cutting, Punching Grade: Q235B Q345 20# 45# Length:1-12m as required	5 pcs	1:5

		Material:Q235B Q345 20# 45# MOQ:2 Tons and Bar Iron Rod 10mm 12mm 14mm Hrb400 Hrb500 Steel Rebar and High quality ss304 316 201 410 3mm-14mm stainless steel angle bar		
29.	Plain steel sheet	Width: custom, Grade:400 Series, Tolerance: ±10% Processing Service: Welding, Punching, Cutting, Bending, decoiling, Steel Grade:410, 420J1, 410S, 430, 409L, 420J2, Surface Finish: BA	5 pcs	1:5
30.	Steel pipe and conduit	Outside:8~100mm, Unit length:3m, 5.8m, 6m, 11.8m, 12m, 13.5m or as request Material:A53,ST33,A283,A135,ST37,A53,A106,ST35,A179 And Material: PVC Color: Customized External size:16mm, 21mm,27mm,35mm,41mm,53mm; Internal size:1/2, 3/4, 1, 1-1/4, 1-1/2, 2	5pcs	1:5
31.	Sulfuric acid	2 litters CAS NO (7664-93-9 sulfuric acid 98% quality assured) Grade: AR	1 liter	1:25

32.	Tip top	Natural Rubber Oval 24 x 35mm	5 pcs	1:5
33.	Tracing Paper	Paper A4 & A3, GSM: 80 – 120	1 ream	1:25
D.	**Tools and Equipment**			
1.	Air compressor	compressors 8bar mini portable piston air compressor	1	1:25
2.	Air impact wrench kit	6pcs ¾", ½ Inch 14 Piece Cr Mo impact socket set: 10-24mm.	1 pc	1:25
3.	Allen key,	10pcs set;MM:0,7,0,9,1,27,1,5,2,0,2,5,4,0,4,5,5,0,5,5,6,0,7,0,8,0,10,0;inch:0.028,0.036,0.036,0.05,1/16,5/64,3/32,7/64,1/8,9/64,5/32,3/16,7/32,1/4,5/16,3/8;DIN 911	Set	1:25
4.	Alternator	Power: 2.5 KVA TO 25.0 KVA kVA: 2.5 KVA TO 30.0 KVA Speed: 1500 RPM	1 pcs	1:25
5.	Arm Chair	55 X 100 x 70 cm	25 pcs	1:1
6.	Axel stand: load capacity	min7,5 tons; height adjustable by thread spindle; height :2*1410-2070mmn,2*950-1450mm	1pcs	1:25
7.	Baskets	265*285mm	1 pcs	1:25
8.	Battery charger	Input (230 V AC / 50 HZ), Charger mode Manual,6/12 V, current 2/10/40A,boost	1pc	1:25

		200A,Adapter battery: GEL/AGM/STD lead battery		
9.	Bending machine	hydraulic metal sheet plate folding servo press brake bending machine and Nominal Pressure (KN) 300, 630, 800 and 1000.	3	1:8
10.	Bottle car jack:	5ton ,10ton: conforms with VBG-8 standard	1pcs	1:25
11.	Breaker devices	10,000 psi (700 bar) air/hydraulic pump, For 25“to 51" giant tire pressure the stripping operation, puller. Weight :31 lbs(14kg),Max Pressure: 10,000psi (700bar) and Pressure Range: 40-150psi (2.8 to 10.3Bar)	5	1:5
12.	Chain block	lifting capacity :3000kg; lifting Hight :3m; tempered and galvanized chain according to EN818-7	1pcs	1:25
13.	Chisels	Material High Carbon Steel and Tip Width 1 to 2in	5	1:5
14.	Clip board	Clipboard with Tripod, Size:31.6*23mm	5pcs	1:5
15.	Combination wrench:	28 pieces; metric; DIN 3113A/ISO 3318/7738;5.5mm,6mm,7mm, 8mm,9mm,10mm,11mm,12m m,13mm,14mm,15mm,16mm,		1:25

		17mm,18mm,19mm,20mm,21 mm,22mm,23mm,24mm,25m m,26mm,27mm,28mm,29mm, 30mm,32mm,34mm,	Set	
16.	Compass	Metal, Plastic and Technical / Students Drafting	25	1:1
17.	Connectors	3Ways Female 70311Y	5 pcs	1:5
18.	Desktop Computer	64-bit OS; 8 GB RAM; Intel core i7 (Processor)	25pcs	1:1
19.	Detergents	Rug and 5lt liquid soap	5	1:5
20.	Dial gauge	Measurement accurace 1 µm, part number: 513-405-10E, range 0.2mm, resolution: 0.002mm, stem length, 0.3 inche,	5	1:5
21.	Digital multimeter	low battery display, auto-range function, background illumination, auto switch is-off; TUV/GIS tested (IEC EN 61010-1, DIN VDE 0411); measuring range: direct current voltage:200mv to 600V; alternating voltage :200mv to600v,DC:200microampere to 10 A,AC:200MICRO AMPERE TO 10A,resistant 200Ohm to 20 ohm ,with carry bag, cables and battery	5 pcs	1:5
22.	Divider	Metal, plastic and Technical/ student drafting	25	1:1

23.	Double open-end wrench:	12 pieces; metric; double -end; CV-steel; DIN 3110/ISO 1085;6*7mm,8*9mm,10*11mm,12*13mm,14*15mm,16*17mm,18*19mm,20*22mm,21*23mm,24*27mm,25*28mm,30*32mm	set	1:25
24.	Double ring wrench:	12 pieces; metric; double end; CV -steel; DIN 838 /ISO 3318 ;8*9mm,10*11mm,12*13mm, 14*15mm,16*17mm;18*19mm,20*22mm,21*22mm,21*23mm,24*27mm,25*28mm,30*32mm	Set	1:25
25.	Drawing board	Flat wood, 23 × 30 cm, 40 × 53 cm or 46 × 60 cm	25	1:1
26.	Drawing Pencil	0.5mm	25	1:1
27.	Drawing Template	Flat piece of plastic having various cutout shapes	25	1:1
28.	Drill machine	Drilling machine 7.5KW radial arm drill press, Drilling Capacity 80mm, Number of spindle speeds 6,Distance between spindle nose and working surface of base plate 500-2070 mm and range of spindle speeds 16-1250 r.p.m	1	1:30
29.	Dusting Brush	Brush Material:Nylon,Size:5.8*2CM	25	1:1
30.	Electric tool box (full set)	min 64 pieces, content	5 Set	1:5

		:(complies DIN VDE0680) crimping peelers ,230mm, insulated multi-grid pliers, CB/steel, wire cutter 115mm,wire cutter 160mm,VDE		
31.	Erasing shield	Thin flat piece of metal of various sized cutouts	25	1:1
32.	Fork lift	Lift motor 2.8KW	2pcs	1:12.5
33.	French Curve	ellipse, parabola, hyperbola, involutes	25	1:1
34.	Fuse	5-25 amp	5 pcs	1:5
35.	Grinders	4-1/2" 18 V Cordless Angle Grinder Table mounted, with voltage 230V, frequency 50 Hz; min.500W;2 grinding discs; IP20	5	1:5
36.	Grinding machine	High power electric tools plug-in angle grinder cutter portable grinder, Wheel Diameter 4 ½ in and Power 1200W	3	1:8
37.	Hacksaw	Blade Material High Carbon Steel and Type Hacksaw Flush	5	1:5
38.	Hammers	machinists hammer, Germen type,300gr, length 300mm, DIN 1041, curved ash handle; sledged hammer, German type, steel head ,3000gr.600mm, DIN 1042, ash handle	5 pcs	1:5

39.	Head light	12V, 60/65W	5 pcs	1:5
40.	Heavy duty bottle -jack H-frame hydraulic press;	multi position bed; working range: max height:.> or = 800mm, max width:> or =550mm; bed opening :> or =120mm; ram dia.:45mm; safety: type-C-norm, DIN EN 693	1pcs	1:25
41.	Heavy duty lever;	in length 60cm; drop forged carbon steel; fine tapered and ground ends	1pcs	1:25
42.	Hoists	Maximum Lifting Weight 2.5ton Maximum Lifting Height 120m	1	1:25
43.	Horn	Voltage: 12V, Rated current<3A	1 pcs	1:25
44.	Hydrometer /batter acid tester	tube length min.52 mm, volume min 18cm^3	5 pcs	1:5
45.	Jacks	5ton 3ton industrial toe jack manual mechanical lifting car jack small lifting jack capacity (Load) :5ton Max Height :680mm Min. Height :60mm Auto repair tool car jacks mini hydraulic bottle jack Capacity (Load) 1-10T Max Height 308mm Min. Height158mm	5	1:5

46.	Lap top	64-bit OS; 8 GB RAM; Intel core i7 (Processor)	1 pc	1:25
47.	layout and Marking tools a) steel and folding ruler b) steel square c)scriber d)trammel point e) punch	Inch, angle	25	1:1
48.	Lead battery	Specific energy(35-40Wh/kg), nominal Cell (2.1V),Min-35C^0- Max45C^0	5 pcs	1:5
49.	Lifting crane:	lifting capacity up to 2 ton; lifting height min 2m; EN 1494:2000+A:2008	1pcs	1:25
50.	Lifting hook:	lifting capacity up to 2 ton; lifting height min 2m; EN 1494:2000+A:2008	1pcs	1:25
51.	Load tester for batteries	6v,12v, insulated copper clamps, 2m, fully insulated leads, complies with EU-guide line 2004 /108/EG and 2006/95/EG	5 pcs	1:5
52.	Micrometer	Small: min/max. Measuring range 0-25mm; medium: 25-50mm, large min/max. 50-75mm; scale value 0.01mm; measuring spindle increments :0.5 mm; forged steel bracket, DIN 863-	5	1:5
53.	Pencil Sharpener	A hand-cranked Planetary sharpener and A manual prism	25	1:1

35–40 ١

		sharpener		
54.	Planer	Size: 35-45mm, total length: 9 ¼", blade width: 45 ¾", measures: 5.30*260*290mm, G.W: 17kg, N.W: 15kg	1	1:25
55.	Plotter toner	Compatible with the existing printer	1	1:25
56.	Plotter with accessories	Support: ISO Device/Android Input:100-240VOutput:24V/2.75A/DC	1 pcs	1:25
57.	Powder fire extinguisher	ABC, EN 3 standard, includes wall brackets	1pc	1:25
58.	Pressure gauge	Psi/Bar	5	1:5
59.	Protractor	Metal or plastic, 360^0	25	1:1
60.	Pry bar/lever	Sizes: 250 mm--10" 300 mm--12" 400 mm--16" 500 mm-- 20" 600 mm--24" 800 mm—28	5	1:5
61.	Punches	length 150mm; tip width :5mm; tempered impact head; complies with DIN 7250	5 pcs	1:5
62.	Reamers	Customized Reamer For Stainless Steel Milling Tungsten Carbide Reamer Set Reamer Size 1-25mm and Flute Length50-150mm	5	1:5

63.	Rubber hammer	Wooden handle (12oz,16oz)	5 pcs	1:5
64.	Sander	Silicon made	1	1:25
65.	Scale	1:1, 2:1, 1:2, 1:10..	25	1:1
66.	Scale ruler	150-1200mm thickened Stainless Steel Ruler with Metric and Inch Scales	5	1:5
67.	Scrapers	Red and black carbon scraper with hole rubber handle Blade Width 3in4IN2in6in5IN,Putty Kinfe Type Multifunction's Scraper and Blade Length 3in4IN6in	5	1:5
68.	Screwdrivers	Screwdriver sets, Material: Chrome Vanadium Steel, size: 160-260mm, weight:0.1kg, handle material: rubber	5 pcs	1:5
69.	Socket	Rated Current: 200A/250A Operation voltage: 1000V	5 pcs	1:5
70.	Sockets wrench	1/4" and ½" socket wrench ,72 teeth ;ratchet with lever reverse ;DIN 3126;ISO 1173 ;59 pcs :1/4": lever ratchet ,25mm angled extension ,150mm extension ,150mm flex extension ,cardan joint ,1/4" screw driver handle ,adapter quick -change chuck, socket wrench inserts (4,5,5.5,6,7,8,9,10,11,12,13,14); PH bits(PH 1,2,3);hexagon	5 pcs	1:5

		bits(3,4,5,6mm);TX bits (TX 10,15,20,25,27,30,40);slotted bit 0.8*5.5mm;1/2": lever ratchet;53mm angled extension ;125mm extension;1 cardan joint ;socket wrench inserts(10,11,12,13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28,30,32)		
71.	Solenoid	AC12V, 24V, 110V, 220V, and DC 24V, 48V, 60HZ	5 pcs	1:5
72.	Spanner	Material: Special Alloy Steel 7pcs / 11pcs per set, All 2 types with cloth bag	5 pcs	1:5
73.	Starter motor	Nominal voltage: 12V, Power output: 4.2 H.P, Max. HP Speed:1370 R.P.M, Stall Torque: 4.5 Kg-m, Direction of Rotation: Clockwise, Pinion No. of Teeth:11, Pinion Module pitch:3	5 pcs	1:5
74.	Table	Wooden table	25 pcs	1:1
75.	Tachometer	Digital Tachometer, 2.5-99999rpm, resolution: 0.1rpm (2.5 ~ 999.9rpm), basic accuracy: ± (0.1% n + 5d) rpm, (1000 ~ 99999rpm), sampling rate: 1 time/sec. test distance: 50-500mm	5	1:5
76.	Tail light	12V,60/65W	5 pcs	1:5

77.	Tap and die	set min 67 pcs, for standard metric ISO threads of M3-M20 (steel up to 850N/mm2 and cast iron), quality HSS-E, in assortment box	5	1:5
78.	Test lamp	DC: 3-48 volts, Resolution 0.1v, accuracy: +/- 0.3 Volts, operating tem: 0 -120 degree, prob length: 3-1/2"	5	1:5
79.	Test light screw driver	for 12v and 24v, with solid clamp	5 pcs	1:5
80.	Thread cutting tools	110Pcs Tap and Die Set Metric Wrench Cut M3-M12 Tap and Die Kit Metric Hand Threading Tool Set Engineer Kit with Metal Case Material Carbon steel Thread Size M3X0.5/M4X0.7/M5X0.8/M6 X0.75/M7X0.75/M8X1.0/M10 X1.	2	1:15
81.	Timing light	4-feet long lead, 12V ignition systems supported, ergonomic design, high RPMs, ideal for 2-stroke and 4-stroke engines	5	1:5
82.	Torque wrench	10 to 500Nm (855mm length)	5pcs	1:5
83.	Torque wrench:	fine toothed rachet heat (72 teeth);1*0-25Nm;1*25Nm,1*120-300; tip size ½”; accuracy +or -3%; scaling in Nm and lbf/ft;	1 pcs	1:25

		complies with DIN EN ISO 6789:2003		
84.	Triangle (Set-Square)	90^0 _ 45^0 _ 45^0	25	1:1
85.	Triangle (Set-Square)	90^0 _30^0 - 60^0	25	1:1
86.	Trolley car jack	capacity:5 ton,10ton; conforms VBG-8 standard	1pcs	1:25
87.	T-Square	1m length	25	1:1
88.	Tyre balancer	Max. Rim Diameter 2600mm Max. Rim Width 1400mm	1	1:25
89.	Tyre changer machine	Factory heavy duty truck tire changer truck tire changer equipment Max. Rim Diameter 62"/1600mm Max. Rim Width 30"/780mm	1	1:25
90.	Tyre remover	1/2 Inch Air Impact Wrench 1100 Nm. Impact Spanner Large Torque Car Tire Removal Tool Sockets Pneumatic Tool Pressure :0.63Mpa	5	1:5
91.	Vernier Caliper	max length measuring range :0-150mm; nonius measuring accuracy :0.05mm with knife points and locking screws; reading 1/20mm; stainless, nonius and scale matt chrome - plated; DIN 862	5	1:5
92.	Vice	3/4/5/6/8/10 Inch Multi-purpose Cast Iron Bench Vise	5	1:5

		Vice with Swivel Base		
93.	Vulcaniser	Input Voltage 110V Input power 500 wx2	1	1:25
94.	Wheel block	truck parking block wheel chock block wheel car stopper truck wheel stopper Height (mm) :355 Width (mm) :204	5	1:5
95.	Whit-board/Blackboard	240 x 120 cm	1pcs	1:25
96.	Wire	15-20 amp	5 role	1:5
97.	Wrench	Item Dimensions (LxWxH) 7.4 x 2.6 x 0.4 inches and 0.2 pound	5 pcs	1:5
E	**Personal protective Equipment**			
1.	Chemical splash suit	Protect chemical splash	25pcs	1:1
2.	Hearing protection	(ear defenders), EN352-1	25	1:1
3.	Helmet		25pcs	1:1
4.	Overalls	With hood, antistatic	25pieces	1:1
5.	Protection goggles	scratch resistant, against mechanical hazards (mechanical strength)	25	1:1
6.	Respiratory mask,	no valve, DIN EN149, FFP1	25	1:1
7.	Reusable ear plugs	S12.6 -1984, CE, CSA A(L), measure 26 dB , One size fits all and has catalogue number SN-86310-21 with Quadruple	25pcs	1:1

		flanges, corded,		
8.	Rubber apron	one size fits most(120*180cm); strong PVC material; chemical resistant	25	1:1
9.	Rubber apron	one size fits most(120*180cm); strong PVC material; chemical resistant	25	1:1
10.	Rubber gloves,	battery acid resistant, EN 374, Cat III	25	1:1
11.	Safety gloves	Resistant to PCBs & chlorinate and aromatic Solvents, Heavy duty, Heat resistant (up to 260oc), Electrical insulating rubber gloves (up to 750v)	25pcs	
12.	Safety goggles	YAG, diode, co2 protector 32% light transmission, green lens, AS1337.4	25pcs	1:1
13.	Safety shoes	mixed sizes, safety category S1 (EN ISO 20345:2011)	25	1:1
14.	Steel capped boots/shoes	strong, durable	25pices	1:1
16.	Working overall	size M-XL	25	1:1

4. Developers Profile

No	Name	Qualification (Level)	Field of Study	Organization/ Institution	Mobile number	E-mail
1	EYOB T/MARIYAM	BSc	Agricultural Engineering	Alage ATVET	0926528585	eyobtmariam@yahoo.com eyobveronika@gmail.com
2	YITAYEW LINGEREW	BSc	Automotive Engineering	Alage ATVET	0931882627	yitayewling21@gmail.com
3	ABAYENEH AWOKE	BSc	Agricultural Engineering (Agricultural Mechanization Engineering)	Alage ATVET	0920075051	abayaweke28@gmail.com
4	TSEGAYE DELELEGN	MSc	Agricultural Machinery Engineering	Alage ATVET	0910691740	tsegamaraki21@gmail.com
5	SARA ADDISU	MSc	Agricultural Machinery Engineering	Agarfa ATVET	0913279948	heni1sara@gmail.com