



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

AGRICULTURAL CROPS

PRODUCTION

Grade 11/12

Course Description:

This course equips learners with essential skills in Agricultural Crops Production, focusing on crop farm production in accordance with Good Agricultural Practices (GAP). The course includes plant care and management, harvesting and post-harvesting operations, and marketing of farm produce. After completing the course, learners are eligible to take assessments to earn the National Certificate Level II in Agricultural Crops Production. They may also pursue higher education or careers in the crops production industry.

Elective: Technical Professional

Prerequisite: None

Time Allotment: In Grade 11, 320 hours for two semesters, 8 hours per week. In Grade 12, 320 hours for one semester, 16 hours per week

Schedule: First/Second Semester

QUARTER I

Content Standard:	The learners demonstrate understanding of principles on the overview of agricultural crops production, farm tools, implements, and simple equipment, and pre-operative check-up following the manufacturer’s manual.
Performance Standard:	The learners perform pre-operative checking of tools, farm implements, and equipment in accordance with the manufacturer’s manual.
LEARNING COMPETENCIES	CONTENTS
1. Discuss the overview in agricultural crops production	Overview of Agricultural Crops Production <ul style="list-style-type: none"> • Career and business opportunities • Challenges • Common terminologies • Technology and innovation <ul style="list-style-type: none"> ○ hydroponics ○ container gardening ○ vertical gardening ○ aquaponics ○ aeroponics

	<ul style="list-style-type: none"> ○ agroforestry ○ monoculture ○ artificial intelligence <ul style="list-style-type: none"> - genetic engineering - robotics - machine learning ○ precision agriculture <ul style="list-style-type: none"> - GPS - drones - satellite
<p>2. Discuss the safety standards in agricultural crops production</p>	<p>Safety Standards in Agricultural Crops Production</p> <ul style="list-style-type: none"> • Occupational Safety and Health Standards in Agricultural Crops Operations <ul style="list-style-type: none"> ○ safety regulations ○ hazards and risks ○ contingency measures ○ waste disposal management • Philippine Good Agricultural Practices (PhilGAPs) <ul style="list-style-type: none"> ○ for certification ○ for sustainable agriculture
<p>3. Classify the different farm tools, implements, and equipment according to work requirements</p>	<p>Farm Tools, Implements, and Equipment</p> <ul style="list-style-type: none"> • Hand tools <ul style="list-style-type: none"> ○ digging tools ○ propagation tools ○ harvesting tools ○ measuring tools • Farm implements and equipment <ul style="list-style-type: none"> ○ water pumps ○ hand tractor ○ plow ○ harrow ○ sprayer • Maintenance of farm tools, implements and equipment <ul style="list-style-type: none"> ○ corrective

	<ul style="list-style-type: none"> ○ preventive ○ schedule
4. Perform pre-operative checking of tools, farm implements and equipment in accordance with manufacturer's manual	<p>Pre-operative Checking of Tool, Implements, and Simple Equipment</p> <ul style="list-style-type: none"> • Inspection of tools and implements <ul style="list-style-type: none"> ○ physical condition ○ sharpness ○ cleanliness ○ functionality ○ lubrication and greasing • Safety features and precaution <ul style="list-style-type: none"> ○ protective shield and guards ○ safety switches ○ PPE ○ warning labels • Fuel and oil check <ul style="list-style-type: none"> ○ fuel level ○ oil level • Battery condition • Operational readiness <ul style="list-style-type: none"> ○ environmental consideration

QUARTER II

Content Standard:	The learners demonstrate understanding of kinds and varieties of planting materials and characteristics of good planting materials.
Performance Standard:	The learners perform growing media preparation, nursery operations, and planting of crops based on industry practices and Philippine Good Agricultural Practices.
LEARNING COMPETENCIES	CONTENTS
1. Identify good quality planting materials according to kinds	Kinds of Planting Materials

	<ul style="list-style-type: none"> • Seeds • Cutting • Grafts and buds • Tubers • Bulbs • Tissue culture • Root stocks and scion • Corms • Runners • Suckers • Rhizome <p>Characteristics of Good Planting Materials</p> <ul style="list-style-type: none"> • Seeds • Seedling
<p>2. Identify varieties of crops produced in their locality</p>	<p>Different Local Varieties of Crops</p> <ul style="list-style-type: none"> • Field crops • Plantation crops • Herbs • Spices • Vegetables • Fruit • Flower
<p>3. Prepare growing media according to prescribed mixture and crop requirements</p>	<p>Crop Requirements</p> <ul style="list-style-type: none"> • Soil type preference • Water retention • pH range of the soil • Macro and micro nutrients • Moisture content • Humidity <p>Growing Media</p> <ul style="list-style-type: none"> • Components of growing media

	<ul style="list-style-type: none"> ○ garden soil ○ peat moss ○ saw dust ○ coco coir ○ rice hull/carbonized rice hull ○ compost ○ river sand ○ animal manure ○ wood cuttings ○ fern slabs ○ driftwood ● Steps for preparing growing media ● Ratio in mixing growing media
4. Perform nursery operations according to industry standards	<p>Nursery Work Operation</p> <ul style="list-style-type: none"> ● Site selection ● Setting-up of nursery shed ● Propagation techniques ● Seedling and plant growth management ● Weed management ● Pest management ● Environmental control ● Transplanting and hardening-off ● Post-harvest and sales
5. Perform planting of crops based on enterprise protocols	<p>Planting of Crops</p> <ul style="list-style-type: none"> ● Crop production guide ● Planting systems <ul style="list-style-type: none"> ○ open field ○ green house ● Field layout ● Pre-planting operation <ul style="list-style-type: none"> ○ land preparation ○ clearing ○ soil analysis

	<ul style="list-style-type: none"> ○ basal fertilizer application • Method of planting <ul style="list-style-type: none"> ○ direct planting ○ transplanting • Holes based on crop requirement
6. Perform plant care management practices	Plant Care Management Practices <ul style="list-style-type: none"> • Cultivation • Thinning/prickling • Weeding • Pruning • Trellising

QUARTER III

Content Standard:	The learners demonstrate understanding on irrigation system, fertilizer application, and pests and diseases management in crops production.
Performance Standard:	The learners perform fertilization and pest control in crops production based on Good Agricultural Practices (GAP).
LEARNING COMPETENCIES	CONTENTS
1. Discuss irrigation system in crops production 2. Design irrigation system based on plant requirements	Irrigation System in Crop Production <ul style="list-style-type: none"> • Equipment in irrigation installation <ul style="list-style-type: none"> ○ soil moisture monitoring ○ dosing pump ○ irrigation controller ○ climate controller ○ solar radiation sensors ○ environmental sensors ○ water analyzer • Water analysis • Water requirements • Irrigation system

	<ul style="list-style-type: none"> ○ types of irrigation <ul style="list-style-type: none"> - surface irrigation - sub-surface irrigation - overhead irrigation ○ care and maintenance
3. Perform fertilizer application based on needed nutrients in crops production practicing Occupational Safety and Health Standards (OSHS) and Good Agricultural Practices (GAP)	<p>Fertilizer in Crops Production</p> <ul style="list-style-type: none"> • Plant nutrients <ul style="list-style-type: none"> ○ macro and micronutrients ○ functions in plant growth • Types and kinds of fertilizer <ul style="list-style-type: none"> ○ organic <ul style="list-style-type: none"> - compost - vermicompost - concoction - animal manure - green manure ○ inorganic <ul style="list-style-type: none"> - straight fertilizer - complex and mix fertilizer - complete fertilizer • Fertilizer computation based on recommended rate <ul style="list-style-type: none"> ○ soil sampling ○ soil analysis • Method of fertilizer application <ul style="list-style-type: none"> ○ basal ○ side-dress ○ top-dress ○ localized ○ band ○ foliar/spray
4. Analyze plant pests and diseases in crops production	<p>Pest and Diseases in Crops Production</p> <ul style="list-style-type: none"> • Types of plant pest and diseases <ul style="list-style-type: none"> ○ signs and symptoms ○ prevention

5. Apply prevention and control of pests and diseases in crops production	<ul style="list-style-type: none"> • Methods of control procedure <ul style="list-style-type: none"> ○ physical ○ mechanical ○ biological ○ cultural ○ chemical ○ sanitation ○ Integrated Pest Management (IPM)
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QUARTER IV

Content Standard:	The learners demonstrate understanding of the principles in harvesting crops according to industry practices.	
Performance Standard:	The learners perform harvesting and post-harvesting operation according to industry practices and selling of produced crops in the locality.	
LEARNING COMPETENCIES		CONTENTS
1. Perform harvesting operations in crop production	Harvesting of Crops <ul style="list-style-type: none"> • Maturity indices • Method of harvesting • Factors affecting harvesting 	
2. Perform post-harvest in crop production	Post-Harvest Operations <ul style="list-style-type: none"> • Grading and sorting of crops • Labeling • Packaging • Handling of produce • Washing • Cleaning • Trimming • Fermenting • Drying 	

	<ul style="list-style-type: none"> • Post-harvest treatment <ul style="list-style-type: none"> ○ hot water treatment ○ vapor heat treatment ○ chemical treatment ○ best practices in drying ○ pre-cooling treatment • Hauling and transporting of crop produce • Recordkeeping of harvested crops and post-harvest losses • Workplace Sanitation <p>Storage of Crop Produced</p> <ul style="list-style-type: none"> • Principle of crop storage <ul style="list-style-type: none"> ○ moisture ○ temperature control ○ air circulation • Storage facility <ul style="list-style-type: none"> ○ traditional storage ○ cold storage ○ warehouse ○ metal silos
<p>3. Perform selling of harvested crops in the locality</p>	<p>Price Monitoring</p> <ul style="list-style-type: none"> • Farm gate • Trading centers • Local market • Supply and demand <p>Types of Buyers</p> <ul style="list-style-type: none"> • Processor or manufacturer • Supermarket • Local traders • Trading centers • Public market • Wholesaler

	<ul style="list-style-type: none"> • Retailer • Contract selling <p>Selling Strategies</p> <ul style="list-style-type: none"> • Direct selling • Niche market • Online and digital selling • Wholesale selling • Retailing
4. Prepare crops production report in accordance with enterprise reporting procedures	<p>Recordkeeping in Selling Operation</p> <ul style="list-style-type: none"> • Importance of recordkeeping • Tools for recording and reporting <ul style="list-style-type: none"> ○ manual ○ spreadsheet software ○ accounting software ○ Point of Sale (POS) systems • Sales report • Inventory

GLOSSARY

aeroponics - the method of growing plants in an air or mist environment without soil or an aggregate medium, with roots suspended and sprayed with nutrient-rich water for survival

animal manure - animal waste used as a natural fertilizer to enrich soil

aquaponics - a sustainable agricultural method that combines hydroponics and aquaculture, or the growing of fish. Plants receive nutrients from fish waste, and the plants in turn filter and purify the water for the fish.

Artificial Intelligence (AI) - the use of computer algorithms and machine learning to analyze data, predict outcomes, and make decisions that assist in optimizing agricultural practices

basal fertilizer application - applying fertilizers before planting to prepare the soil with essential nutrients

basal - a fertilizer applied at the time of planting

bulbs - storage organ consisting of an underground bud with fleshy scales

cleanliness - the degree to which equipment and working spaces are free from dirt and debris to maintain efficiency and safety

clearing - the removal of vegetation, rocks, or debris from the land to make it suitable for cultivation.

complete fertilizer - the type of fertilizer that contains all the essential macronutrients: Nitrogen, Phosphorus and Potassium (N, P, K)

complex and mix fertilizer - fertilizers that contain a combination of nutrients or compositions

compost - a complex decomposed organic matter used to improve soil fertility for crop growth and nutrition enhancement. It is a decomposed organic matter used as a natural soil conditioner or enhancer

concoction - a mixture, often taken from boiled plant or natural materials, used for fertilizing or pest control

corms - swollen underground stems that can produce new plants, such as in crocuses or gladioluses

direct planting - planting of seeds directly into the prepared soil without transplanting

drones - unmanned aerial vehicles used for surveying fields, mapping, monitoring crop health, and delivering inputs like fertilizers or pesticides

fern slabs - sheets made from ferns used in epiphytic plant cultivation

fuel level - the amount of fuel in machinery to ensure uninterrupted operation

functionality - the equipment or systems operating correctly as designed

garden soil - general-purpose soil for planting in gardens, often a mix of loam, clay, and organic matter, or a combination of

genetic engineering - the manipulation of an organism's DNA to achieve desirable traits, such as increased resistance to diseases or improved nutritional content or alteration in crops to increase efficiency

GPS (Global Positioning System) - a satellite-based system used for mapping fields, monitoring equipment, and guiding machinery to improve field operations and efficiency

grafts and buds - techniques involving the joining of plant tissues from different plants to propagate a new plant or improve characteristics

green manure - crops grown specifically to be turned into the soil to improve its fertility

Greenhouse Planting System - planting of crops in controlled environments like greenhouses that provide protection and regulated conditions suitable to the crops being planted

hand tractor - a small, manually operated tractor used for tasks like tilling, plowing, and transporting materials

harrow - a farming tool used after plowing to break up clumps of soil, level the surface, and remove weeds

hydroponics - a method of growing plants without soil, using nutrient-rich water solutions to provide essential nutrients directly to the plant roots

land preparation - the process of preparing the land for planting, including clearing, tilling, fertilizing, and post-harvesting

inventory - the record of production, materials and equipment, total quantity of harvested crops that are stored and available for sale, processing, or consumption but have not yet been sold or used

lubrication and greasing - the application of oil or grease to moving parts to reduce friction and wearing

macro- and micronutrients - the nutrients required by plants. Macronutrients (e.g., nitrogen, phosphorus) are needed in larger quantities while micronutrients (e.g., iron, zinc) are needed in smaller amounts

monoculture - the cultivation of a single crop over a large area to increase yield efficiency but may lead to problems like soil depletion and vulnerability to pests and diseases

oil level - the amount of oil needed to ensure proper lubrication of machinery, preventing damage

Open Field Planting System - planting of crops directly in open fields without protective structures allowing free range growth

overhead irrigation - the process of watering crops using sprinklers or similar systems that spray water over the plants

peat moss - organic material used for improving soil structure and water retention

pH range - level of acidity or alkalinity in the soil, which can affect nutrient availability

physical condition - the state of equipment or infrastructure, such as being undamaged or working as intended

plow - a tool used to break up and turn over soil, preparing it for planting

PPE (Personal Protective Equipment) - gear worn or used by workers to protect against hazards such as chemicals, sharp tools, debris, machinery, etc.

precision agriculture - the use of technology to monitor and manage crops and livestock with great accuracy, optimizing the use of resources and improving yields

preventive maintenance - the maintenance activities performed to prevent potential issues before they occur

protective shield and guards - safety barriers that prevent accidental contact with dangerous parts of machinery

rhizome is a horizontal underground stem that stores nutrients and can produce new shoots, such as in ginger

rice hull/carbonized rice hull - the outer covering of rice grains, used for improving soil structure or as a growing medium.

river sand refers to the coarse sand often used to improve drainage and soil structure

robotics - technological application of robots to automate tasks such as planting, harvesting, and monitoring crops, increasing efficiency and reducing manual labor

rootstocks and seedlings: rootstocks are the base of a grafted plant, while seedlings are young plants grown from seeds

runners - stems that grow horizontally from the base of a plant and can produce new plants, like in strawberries

sales report - the report that details the transactions involving the sale of crops over a specific period or production timeline

satellite - a technology used for remote-sensing and monitoring large-scale agricultural data, such as crop health, weather patterns, and soil moisture levels

schedule - a plan or outline when specific tasks or maintenance should be carried out

seeds are the reproductive structures used to grow new plants

sharpness - the condition of cutting tools, ensuring they are sharp enough for effective operation

side-dress - an application of fertilizer or soil amendments between the rows of growing crops

soil analysis is the testing of soil to determine its pH, nutrient levels, and other properties

soil type preference - the specific type of soil best suited for a particular crop, considering texture, drainage, and fertility

sprayer - an equipment used to apply pesticides, herbicides, or fertilizers to crops to control pests and diseases and promote growth

straight fertilizers - fertilizers that provide a single nutrient in support to the targeted need of the crop, such as urea (nitrogen)

sub-surface irrigation - watering crops below the soil surface using drip or other irrigation methods

suckers - shoots that grow from the base of a plant or from roots, forming new plants

surface irrigation - watering of crops by allowing water to flow over the soil surface

tissue culture - a technique/method to grow new plants from small tissue samples under sterile conditions in a nutrient-rich medium to produce desired crop characteristics

top-dress - a process by which any material from either natural or synthetic origin is added to the soil to supply nutrients to a plant or crop

transplanting - planting of young plants from a seedbed or container into the field

tubers - underground storage organs of a plant that can grow new plants, such as potatoes

vermicompost - compost produced with the help of worms to create nutrient-rich soil

vertical farming - practice of growing crops in vertically stacked layers or structures, often within controlled indoor environments, to maximize space usage

warning labels - visual or written indicators placed on equipment to alert users to potential dangers and safety precautions

water pumps - devices used to move water from a source to fields for irrigation purposes

water retention - the ability of soil to hold water, which is vital for plant growth

wood cuttings - pieces of wood used for propagation or as a growing medium

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LIST OF MATERIALS, TOOLS, AND EQUIPMENT

MATERIALS	TOOLS	EQUIPMENT
agri-bag/plastics	basin	button dipper
assorted seedlings	bolo	comb-tooth harrow
bamboo stick	broomstick	computer
basket	budding knife	grass cutter
board marker	cutter	hand sprayer
bond paper	garden hoe	hand tractor
brush	hand trowel	knapsack sprayer
calculator	hard hat	mist sprinkler
clips	harvesting pole	overhead sprinkler
detergent soap	head shear	pH meter
eraser	hole digger	post-harvest treatment equipment
fertilizers	kitchen knife	power sprayer
fertilizers	ladder	PPE
first aid supplies	measuring cups	projector
fish net	pail	soil moisture kit
flower inducer	pick mattock	wheelbarrow
fungicides	plastic crates	
measuring tape	pliers	
meter stick	plow	
mulching materials	pruning saw	
pe bags with different sizes	pruning shear	
permanent pens	rake	
pesticides	scissors	
pesticides and insecticides	scythe	
petri dish	shovel	

plastic sheets	soil auger	
plastic twine	sprinklers	
propagating and growing media	steel bar	
puncher	styro crates	
rooting hormone	tools and storage cabinet	
rope	wooden crates	
rubber band		
seed box		
seedling tray with different holes		
sharpening stone		
strainer		
string		
pesticides and insecticides		