



Republic of the Philippines

Department of Education

DepEd Complex, Meralco Avenue, Pasig City

STRENGTHENED SENIOR HIGH SCHOOL CURRICULUM

FOOD PROCESSING

Grade 11/12

Course Description:

This course equips learners with essential skills in food processing, focusing on the different methods of food processing and packaging in accordance with industry standards. The course includes the different methods of food processing and marketing processed foods in accordance with the industry standards. After completing the course, learners are eligible to take assessments to earn the National Certificate Level II in Food Processing. They may also pursue higher education or careers in the food processing 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 1

CONTENT STANDARD:	The learners demonstrate an understanding of the overview, use, and maintenance of tools and equipment, and Occupational Safety and Health (OSH) practices in food processing and fish product packaging.
PERFORMANCE STANDARD:	The learners perform maintenance of food processing and fish product packaging tools, materials, and equipment in accordance with industry standards.
LEARNING COMPETENCIES	CONTENTS
1. Discuss the overview of food processing and fish product packaging	Overview of Food Processing and Fish Product Packaging <ul style="list-style-type: none"> • History of food processing and preservation • Emerging industry trends, technologies and innovations <ul style="list-style-type: none"> ○ Surimi-based products • Career and business opportunities in food processing and fish product packaging • Sustainability, ethical and environmental considerations • PNS (Philippine National Standards), Philippine Food safety Laws, RA 10611 (Food Safety Act)

	<ul style="list-style-type: none"> • Principles of food quality and safety <ul style="list-style-type: none"> ○ Hazard Analysis and Critical Control Points (HACCP) ○ Sanitation Standard Operating Procedure (SSOP) ○ Good Manufacturing Practices (GMP) ○ Current Good Manufacturing Practice (CGMP)
2. Discuss halal principles and practices in food processing	<p>Halal Principles and Practices</p> <ul style="list-style-type: none"> • Concept of halal and its significance to Islamic principles and practices • Halal dietary laws, permissible and prohibited foods, and food preparation guidelines • Process of halal certification • Principles and procedures of halal slaughter for meat and poultry
3. Determine the different tools, materials, and equipment in food processing, packaging, and labeling	<p>Tools, Materials, and Equipment in Food Processing and Fish Product Packaging</p> <ul style="list-style-type: none"> • Food processing and fish product packaging tools and equipment • Packaging and labeling tools and equipment <ul style="list-style-type: none"> ○ retort pouch ○ vacuum plastic/sealer ○ poly sealers ○ bottles ○ cans
4. Perform maintenance of tools and equipment according to enterprise protocols	<p>Maintenance Procedures</p> <ul style="list-style-type: none"> • Corrective • Preventive

5. Discuss Occupational Safety and Health (OSH) procedures in food processing and fish product packaging	Occupational Safety and Health (OSH) <ul style="list-style-type: none"> • Proper use of PPEs • Safety in the workplace • 5S principles • Hygiene and sanitation
----------------------------------------------------------------------------------------------------------	------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------

QUARTER 2

CONTENT STANDARD:	The learners demonstrate an understanding of the principles in processing food through sugar concentration, packaging, labeling, and costing of food products.	
PERFORMANCE STANDARD:	The learners perform food processing through sugar concentration, packaging, labeling, and costing of food products in accordance with industry standards.	
LEARNING COMPETENCIES		CONTENTS
1. Discuss types and classification of packaging in food processing	Types of Packaging <ul style="list-style-type: none"> • Use of vacuum plastic and poly sealer (impulse sealer) <ul style="list-style-type: none"> ○ functions of packaging and labeling processed food by vacuum and poly sealer ○ vacuum plastic sealing and poly sealing challenges and innovations ○ labeling and storing vacuumed and poly sealed products according to industry standards • Use of bottles <ul style="list-style-type: none"> ○ functions of packaging processed food and drinks by bottling ○ bottling challenges and innovations ○ types of tools, materials and equipment ○ new trends, technologies, and innovations in bottling process 	

	<ul style="list-style-type: none"> ○ labeling and storing bottled food and drink products according to industry standards ○ post-packaging procedures in bottling processed food and drinks ● Use of cans <ul style="list-style-type: none"> ○ functions of packaging foods by canning ○ types of canning ○ canning process ○ canning tools, materials, and equipment and its functions ○ new trends, technologies, and innovations ○ labeling and storing canned food and drink products according to industry standards ○ post-packaging procedures in canning processed food and drinks <p>Classifications of Packaging</p> <ul style="list-style-type: none"> ● Primary ● Secondary ● Tertiary
<p>2. Perform processing of food through sugar concentration</p>	<p>Sugar Concentration</p> <ul style="list-style-type: none"> ● Principles of food processing through sugar concentration ● Preparation of tools, equipment, and materials ● Grading and sorting techniques ● Mixing techniques in preparing syrups for fruits and vegetables ● Quality parameters of sugar concentration <ul style="list-style-type: none"> ○ acidity ○ pectin ○ TSS (total soluble solid)

	<p>Types of Sugar Concentration</p> <ul style="list-style-type: none"> • Factors affecting concentration • Application in food • Sugar concentration levels <p>Potential Problems with Sugar Concentration</p> <ul style="list-style-type: none"> • Microbial growth • Texture issues • Flavor imbalance • Health concerns • Processing challenges <p>Important considerations</p>
<p>3. Perform packaging and labeling of sugar-concentrated food products</p>	<p>Packaging and Labeling Sugar-Concentrated Products</p> <p>Finish Product and Inspection</p> <ul style="list-style-type: none"> • Texture • Flavor • Appearance
<p>4. Perform costing of sugar-concentrated products</p>	<p>Costing Parameters</p> <ul style="list-style-type: none"> • Production datasheet • Raw materials cost • Cost of packaging materials • Direct cost based on Suggested Retail Price (SRP) • Selling price

QUARTER 3

CONTENT STANDARD:	The learners demonstrate an understanding of the principles in processing food through salting, curing, and smoking, as well as fermentation and pickling, and packaging, labeling, and costing of food products.
PERFORMANCE STANDARD:	The learners perform food processing through salting, curing, and smoking; fermentation and pickling, packaging, labeling, and costing of food products in accordance with industry standards.
LEARNING COMPETENCIES	CONTENTS
1. Perform food processing through salting, curing, and smoking	<p>Salting, Curing, and Smoking</p> <ul style="list-style-type: none"> • Principles behind processing foods by salting, curing, and smoking • Tools, equipment and materials used in salting, curing, and smoking • Grading and sorting raw materials for salting, curing, and smoking • Quality parameters • Emerging industry trends, technologies, and innovations • Salting, curing, and smoking procedures • Curing solutions and mixtures • Packaging and labeling processed food products • Storage condition • Costing salted, cured, and smoked food products
2. Perform food processing through fermentation and pickling	<p>Fermentation and Pickling</p> <ul style="list-style-type: none"> • Principles behind food processing through fermentation and pickling • Tools, equipment, and materials • Grading and sorting raw materials • Relationships between fermentation and pickling • Types of fermentation: alcoholic, acetic, and lactic • Pickling brine and solutions • Packaging and labeling of fermented products • Costing fermented food products

QUARTER 4

CONTENT STANDARD:	The learners demonstrate an understanding of the principles processing food through drying and dehydration and thermal application, as well as packaging, labeling, costing of food products, and marketing processed foods.
PERFORMANCE STANDARD:	The learners perform food processing through drying and dehydration, and thermal application, costing of food products, packaging, labeling, and marketing of processed foods.
LEARNING COMPETENCIES	CONTENTS
1. Perform food processing through drying and dehydration process	<p>Drying and Dehydration</p> <ul style="list-style-type: none"> • Principles behind food processing through drying and dehydration • Tools, materials, and equipment and its function • Grading and sorting raw materials • Types of drying and dehydration process • Factors affecting the process of drying and dehydration • Drying and dehydration techniques • Packaging and storing dried and dehydrated food products • Costing dried and dehydrated food products
2. Perform food processing through thermal application	<p>Thermal Application</p> <ul style="list-style-type: none"> • Principles behind food processing through thermal application • Tools, equipment, and materials • Thermal properties of food • Thermal processing technologies • Factors affecting thermal processing • Quality control and safety • Heat transfer concepts

	<ul style="list-style-type: none"> • Classification of thermal processing of food • Grading and sorting raw materials <p>Sterilization, Pressurization, and Pasteurization</p> <ul style="list-style-type: none"> • Principles of sterilization and pressurization in food processing • Pressurization and sterilization methods and its objectives • Pasteurization process • Factors affecting pasteurization • Packaging and storing pasteurized food • Sterilization and pressurization process on fruits and vegetables • Packaging and storing sterilized/pressurized food • Sterilization and pressurization process on meats and marine products • Costing sterilized and pressurized food products
3. Perform selling of processed foods	<p>Marketing of Processed Foods</p> <ul style="list-style-type: none"> • Record keeping • Marketing strategies • Cost and return analysis • Product delivery process

GLOSSARY

5S principles - refer to a set of workplace organization and housekeeping techniques used to improve efficiency, safety, and quality in food production environments. These principles come from the Japanese term "5S," which stands for five words that describe steps to create a clean, organized, and efficient workplace (Sort, Set in Order, Shine, Standardize, Sustain).

cGMP - current Good Manufacturing Practices. In the context of food processing, cGMP refers to a set of guidelines and regulations established by food safety authorities (like the U.S. Food and Drug Administration, FDA) to ensure that food products are consistently produced and controlled to meet quality standards and are safe for consumption.

curing - Curing is a method of preserving and flavoring food, particularly meats, by using a combination of salt, sugar, nitrates, nitrites, and sometimes smoke. This process helps to draw out moisture from the food, inhibits the growth of spoilage microorganisms, and enhances the food's taste, texture, and color.

fermentation - is a metabolic process in which microorganisms like bacteria, yeast, or molds convert sugars and other carbohydrates into acids, gases, or alcohol. In food processing, it is used to preserve, flavor, and enhance the nutritional value of food.

food processing - Food processing refers to the transformation of raw ingredients into consumable food products through mechanical, physical, chemical, or biological methods. This process includes various operations such as washing, chopping, cooking, freezing, packaging, and preserving to enhance the shelf life, safety, taste, texture, and nutritional value of food.

GMP - in food processing, refers to a set of guidelines and regulations that ensure the production of safe, high-quality food products. These practices are designed to minimize the risks of contamination, errors, and defects during food production, packaging, and distribution.

grading - refers to the practice of categorizing food products based on specific quality characteristics such as size, shape, color, texture, ripeness, and overall appearance. Grading ensures consistency and helps consumers select products that meet certain standards.

hygiene - refers to the practices, conditions, and measures that are necessary to ensure the safety, cleanliness, and healthiness of food products throughout the processing, handling, and storage stages.

packaging - in food processing refers to the process of enclosing or protecting food products for distribution, storage, sale, and consumption. Packaging serves various functions, including maintaining the quality, safety, and shelf life of food products, while also providing information to consumers and ensuring convenience.

pasteurization - in food processing is a heat treatment process used to kill harmful microorganisms, such as bacteria, yeasts, and molds, in food and beverages. It involves heating the product to a specific temperature for a set period, followed by rapid cooling.

sanitation - refers to the practice of maintaining a clean and hygienic environment to ensure food safety, prevent contamination, and comply with health regulations.

pickling - refers to the preservation method where food, typically vegetables or fruits, is immersed in a solution of brine (saltwater) or vinegar, often with added spices, herbs, and sometimes sugar.

sanitation - refers to the practice of maintaining a clean and hygienic environment to ensure food safety, prevent contamination, and comply with health regulations.

sterilization - refers to the practice of maintaining a clean and hygienic environment to ensure food safety, prevent contamination, and comply with health regulations.

vacuum - refers to the process of creating a low-pressure environment, typically by removing air from a sealed container or packaging. This method is used to preserve food, enhance the texture, and improve shelf life by reducing the presence of oxygen, which is a key factor in the growth of spoilage microorganisms and oxidation.

vacuum sealing - refers to the method of packaging food by removing air from a sealed bag or container, creating a vacuum environment around the food. This process helps preserve the food by minimizing the exposure to oxygen, which slows down spoilage, microbial growth, and oxidation, thereby extending the food's shelf life.

REFERENCES

- Department of Education (DepEd), *MATATAG Curriculum Framework* (Manila: Department of Education, 2024), <https://www.deped.gov.ph/matatag-curriculum>
- Department of Education (DepEd), *Food Processing NC II Curriculum Guide* (Manila: Department of Education, 2019), <https://www.deped.gov.ph/wp-content/uploads/2019/01/Food-Processing-NC-II-CG.pdf>
- Food Processing Institute, "Overview of Food Processing Technologies," *Food Processing Institute*, last modified 2024, <https://www.foodprocessinginstitute.org>
- Technical Education and Skills Development Authority (TESDA). *Food Processing NC II*. Manila: Technical Education and Skills Development Authority, 2024. <https://www.tesda.gov.ph/Downloadables/TR-FOOD%20PROCESSING%20NC%20II%20.pdf>
- Unilever Food Solutions, *HACCP Guide*, 2024, <https://www.unileverfoodsolutions.com.ph/dam/global-ufs/mcos/sea/philippines/website/themes/Free-restaurant-ebooks/haccp-guide/haccp-guide.pdf>
- Food and Agriculture Organization of the United Nations (FAO). "Codex Alimentarius | Food Safety and Quality." *Food and Agriculture Organization of the United Nations*. Accessed November 26, 2024. <https://www.fao.org/food-safety/food-control-systems/policy-and-legal-frameworks/codex-alimentarius/en/#:~:text=FAO%20works%20in%20collaboration%20with,standard%20setting%20activities%2C%20a%20foundational>

LIST OF MATERIALS, TOOLS, AND EQUIPMENT

MATERIALS	TOOLS	EQUIPMENT
Carton strap	Apron	Bag handlers
Corrugated cartons	Autoclave	Blanching Machine
Detergents	Basting spoons	Blanching pots
First aid kits	Blow torch	Blenders
Food grade vacuum punchers	Bottle filling nozzles	Bottling machine/ filler
Gloves	Bottle sanitizer	Brine solution mixing equipment
Hairnets/ cups	Bowls (stoneware, aluminum, glass, stainless steel, unchipped enamelware)	Broiler
Inner carton	Brooms, mops, brushes	Can filling machine
Polu film rolls	Butcher knives	Can rinsing and cleaning machine
Polyethylene bags	calculators	Can sealing machine
Sanitizing solutions	Can sanitizer	Cap sealer machine (manual/ automatic)
Sealing tapes/ adhesives	Candy thermometers	Capper/ capping machine
Vacuum sealer bags or rolls	Canning jars and lids	Charcoal or gas grill
	Cans and lids	Chillers
	Chopping boards	chillers
	Clothesline or drying net bags	Commercial steamer
	Colanders	Convection oven
	Computer/ laptops	Convention oven
	Computer/ laptops	Cooling systems
	Cooking pots and pans/ casserole	Cooling systems (for post pasteurization)
	Cooling pans or trays	Countertop fryer
	Curing bags	Curing chamber
	Cutting tools: knives, slicers, mandoline, Peelers	Curing trays
	Digital scales	Deep fryer
	Digital thermometer	Dehydration oven
	Enamel kettle	Electric food dehydrator
	Fermentation crocks	Electric grill
	Fermentation weights	Electric or manual stirring machines

	Food tongs	evaporators
	Food tongs	Exhaust box
	Food trays	Fermentation airlocks
	Food-grade plastic containers	Fire extinguishers and blankets
	Fruit press or juicer	Food processor
	Funnel	Food processors
	Funnels	Foot bath/ sanitizer stations
	Glass or plastic bottles or jars	Freezer
	Glass or plastic bottles or jars	Gas or electric stove
	Heat resistant gloves	Grinder
	Heavy plate or glass lid	Hanging racks
	Hot plates	Heat sealer
	Hydrometer	High Pressure Processing (HPP) Machine
	Jar lifter	Hot water bath sterilizer
	Jelly thermometer	Hydraulic press
	Lifter	Ice bath
	Mandolin slicer	Immersion circulator
	Measuring cups/ spoon	Impulse sealer
	Measuring spoons and cups	Jack lifts
	Meat injector	Labeling and warning systems
	Meat thermometer	Lid sealing equipment
	Mixing bowls	Machine sealer
	Non-stick pans	Meat grinder/ chopper
	Octo clam plastic protect cup sealer	Meat saws
	pH meters	Meat slicer
	Pickling crocks	Microwave oven
	Poly sealers	oven
	Printer/ scanner	Poly bag sealer / impulse sealer
	Refractometer	Pressure cooker
	Refractometer	Pressure cooker
	Safety glasses/ goggles	Pressure cooker/ pressure steamer
	Safety protocol manuals	Pressure gauge
	Salinometer	Pressure sensor

	Saucepans	refrigerators
	Scalers	Safety signage
	Scissors/ kitchen shears	Salting containers
	Sealers	Sausage stuffer
	Sorting tray	Smoke generator/ smoking chambers
	Spatulas	Smoke house
	Strainers	Smoker
	Strainers or cheesecloth	Soaking vat
	Strainers or sieve	Steam jacketed kettle
	Sugar concentration pans	Steam oven
	Syringe and needle	steamers
	Thermal transfer printer	Tray dehydrator
	Thermocouples/ temperature sensors	trolleys
	Thermometers	Vacuum packaging machine
	Thermometers	Vacuum pump
	Timers	Vacuum sealer machines
	Tongs	Vacuum sealers
	Towels	Waste bins and containers
	Utility tray	
	Water pan	
	Weighing scales	
	Weighing scales of varying capacities & sensitives	
	Wheelers	
	Wire basket	
	Wire basket	
	Wooden ladle	
	Wooden or silicone stirring spoons	
	Wooden spoons	