

RQ03035: FRUIT AND VEGETABLE PROCESSING

1. General information

- Term: 7
- Credits: **Total credits 2 (Lecture: 1,5 – Practice: 0,5) - Self-study: 6** credits
- Credit hours for teaching and learning activities: 30 teaching hours
 - Lectures: 20 teaching hours (1 sections/week, 3 teaching hours/section, 50 minutes/teaching hour. Total in 6 weeks)
 - Presentation/exercise+quiz: 2.5 teaching hours (1 sessions, 2-3 teaching hours/ section, 50 minutes/teaching hour).
 - Lab- work : 7.5 teaching hours (1 section/week, 3 lab-work hours/section, 50 minutes/ labwork hour)
- Self-study: 90 teaching hours (50 minutes each)
- Department conducting the course:
 - Department: Food and Nutrition
 - Faculty: Food Science and Technology
- Kind of the course:

Foundation <input type="checkbox"/>		Fundamental <input type="checkbox"/>		Option 1 <input checked="" type="checkbox"/>		Option 2 <input type="checkbox"/>	
Compulsory	Elective	Compulsory	Elective	Compulsory	Elective	Compulsory	Elective
<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

- Prerequisite course(s): non

2. Course objectives and expected learning outcomes

* *Course objectives:*

- Knowledge: the course provides students with knowledge of fruit and vegetable processing on an industrial scale

- Skills: the course trains students with skills on using the main processing equipment and measuring tools in the fruit and vegetable processing practice laboratory/pilot plant. Calculate the norm of using raw materials when producing 1 type of fruit and vegetable product

- Attitude: the course gives students a hard - working, positive learning attitude, care about environmental protection

* *Course expected learning outcomes*

Program learning outcomes After successfully completing this program, students are able to	Program Learning outcome's performance criteria
PLO1. Apply natural, science knowledge in the Horticulture and Landscape Design.	1.2.

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Commented [NT2]: Bảng này làm ko đúng mẫu

Commented [NT4]: Trong bản tiếng Việt là 1.1

Commented [NT3]: Không đúng với bản tiếng Việt: Áp dụng kiến thức khoa học tự nhiên vào chế biến rau quả để phát triển sản xuất kinh doanh nông nghiệp bền vững

Program learning outcomes After successfully completing this program, students are able to	Program Learning outcome's performance criteria
PLO2. Apply crop farming/cultivation techniques to build high-tech demonstration farms/ advanced procedures for producing horticultural products to meet market demand	2.2
PLO7. Propose strategies to develop horticulture and landscape products to meet the demands of public health, environment and economy in Vietnam and towards the world market	7.3.
PLO9. Take responsibility for environmental protection	9.2

3. Course description

PNH03035. **Fruit and Vegetable Processing.** (2TC: 1.5 - 0.5 - 6)

This module contents includes The general introduction of the subject; Raw materials used for fruit and vegetable processing; Canning and production techniques for some types of canned fruits & vegetables; Fermentation and production techniques of some fermented vegetables; Drying and drying techniques for some fruits and vegetables; Practice exercise 1: Analyse the quality of raw materials and end products; Practice exercise 2: Producing canned fruit juice or vegetable juice; Practice exercise 3: Lactic acid fermentation and assessment this process.

4. Teaching and learning & assessment methods

CELOs	CELO1	CELO2	CELO3	CELO4
Teaching and learning				
Lecturing	x	x		
Practice			x	x
Presentation/ Quiz test/ Exercise	x	x	x	x
Assessment				
Rubric 1. Practice (30%)	x	x	x	x
Rubric 2. Assignment (20%) (Presentation)	x	x	x	
Rubric 3. Final exam (50%)	x	x		

5. Student tasks

- Attendance and attitude: students must attend all lectures and lab- works .
- Prepare materials before going class (self-study): students must read or prepare materials related to the lesson in class following guidance.
- Assignment: All students attending this module must complete an individual assignment (exercise/ essay/ quiz) .

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- Practice/ Lab-work: All students participating in this module must complete Lab-works .
- Final exam: All students taking this course must take the final exam.

6. Text books and references

* Text Books/Lecture Notes:

Ha Van Thuyet, Cao Hoang Lan và Nguyen Thi Hanh. 2015. Fruit and Vegetable preservation & Processing Technology. Bachkhoa publishing house

* Other reference:

Le Van Tan, Nguyen Thi Hien, Hoang Thi Le Hang và Quan Le Ha. (2009). Fruit and Vegetable preservation & Processing Technology. Scientific and technical publishing house

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7. Course outline

Week	Content	Course expected learning outcomes
1	Introduction A/ Main contents: (1 hour) 1. Theories: (1 hour) 1.1. The role of Fruits & vegetables in human life 1.2. Essential calculation in fruit and vegetable processing 2. Practice: (0 hour)	CELO 1,2
	B/ Self-study contents: (3 hours) - Overview of the current situation of fruit and vegetable processing in the country and internationally - The role of the fruit and vegetable processing sector in the national economy	CELO 1,2
1	Chapter 1: Raw material A/ Main contents: (3.5 hours) 1. Theories: (1 hours) - Fruits & Vegetables classification 2. Practice: (2.5 hours) Practical exercise 1: Evaluate the quality of raw materials& end product (canned food, juice ...)	CELO 1,2,3,4.
	B/ Self-study contents: (10.5 hours) - Plant tissue structure - Fruits & Vegetables - Chemical composition of fruits and vegetables and their changes during processing - Methods for Analyzing main chemical components (organic acids TS, TSS); recovery efficiency, net weight, percentage, water.... - National standards for Canned food quality assessment	CELO 1,2
1-4	Chapter 2: Canning technology for fruits and vegetables	

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Commented [NT8]: Đề nghị quý thầy cô rà soát để khớp với bản tiếng Việt các outcomes này

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	<p>A/ Main contents: 1. Theories: (8 hours) 2.1. General principles of fruit and vegetable canning 2.2. Classification of canned fruits & vegetables 2.3. General processing processes in canned fruit & vegetables 2. Practice: (2.5 hours) Practical exercise 2: Producing canned fruit in sirup/ Producing canned fruit vegetable juice</p>	CELO 1,2,3,4.
	<p>B/ Self-study contents: (31.5 hours) - Production techniques of some types of canned fruit and vegetables - Production process of single/mixed canned fruit in syrup - Production process of canned fruit and vegetable juice Exercise - Calculate the amount of sugar/water/syrup to increase or decrease the concentration of sugar solution; - Calculate the amount of sugar, acid, water, raw material (pineapple) needed to process 1/ 10/100 units of canned pineapple in syrup</p>	CELO 1,2
	Chapter 3: Fermentation Technique For Fruit and Vegetable	
	<p>A/ Main contents: (11 hours) 1. Theories: (8.5 hours) 3.1 Concepts, classifications 3.2. The role of fermented products in human life 3.3. Lactic acid fermentation technology (pickle) 3.4. Alcohol/ Wine fermentation technology 2. Practice: (2.5 hours) - Practical exercise 3: Lactic acid fermentation and assessment this process.</p>	CELO 1, 2,3,4.
4-7	<p>B/ Self-study contents: (30 hours) - General Technological process of pickling and pickling process of specific type of vegetables (cabbage/ cucumbers/eggplants/ vegies mixture including carrots, cabbage, radishes....) - General Technological process of wine fermentation and alcohol fermentation for each specific type/group of fruit (grape, domestic apple, lychee, fruit mixture juice...) - Sensory evaluation/ assessment of product quality (pickled vegetables) by scoring method (color, smell, taste, texture)</p>	CELO 1,2
	Chapter 4: Drying technique For Fruit and Vegetable	
	<p>A/ Main contents: (4 hours) 1. Theories: (4 hours) 4.1. The concept, classification of methods, drying products 4.2. The role of dried products in human life 4.3. Fruit and vegetable drying technology 2. Practice: (0 hour)</p>	CELO 1,2,3,4
7, 8		

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	<p>B/ Self-study contents: (12 hours)</p> <ul style="list-style-type: none"> - Advantages and disadvantages, proper object (kind Fruits and vegies) of each drying method - The technological process of drying specific type of Fruits and vegetables (carrots, radishes, mangoes, plums, litchi longans....) - Equipment used to dry fruits and vegetables 	<p>CELO 1,2</p>
	<p>Final exam</p>	<p>CELO 1,2</p>