

## 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
<b>PLO1.</b> Apply natural, science knowledge in the Horticulture and Landscape Design.	1.2.

<b>Program learning outcomes</b> After successfully completing this program, students are able to	<b>Program Learning outcome's performance criteria</b>
<b>PLO2.</b> Apply crop farming/cultivation techniques to build high-tech demonstration farms/ advanced procedures for producing horticultural products to meet market demand	2.2
<b>PLO7.</b> 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.
<b>PLO9.</b> 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

<b>CELOs</b>	<b>CELO1</b>	<b>CELO2</b>	<b>CELO3</b>	<b>CELO4</b>
<b>Teaching and learning</b>				
Lecturing	x	x		
Practice			x	x
Presentation/ Quiz test/ Exercise	x	x	x	x
<b>Assessment</b>				
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) .

- 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

## 7. Course outline

Week	Content	Course expected learning outcomes
1	<b><i>Introduction</i></b> <b>A/ Main contents:</b> ( 1 hour) <b>1. Theories:</b> (1 hour) 1.1. The role of Fruits & vegetables in human life 1.2. Essential calculation in fruit and vegetable processing <b>2. Practice:</b> (0 hour)	CELO 1,2
	<b><i>B/ Self-study contents:</i></b> (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	<b><i>Chapter 1: Raw material</i></b> <b>A/ Main contents:</b> ( 3.5 hours) <b>1. Theories:</b> (1 hours) - Fruits & Vegetables classification <b>2. Practice:</b> (2.5 hours) Practical exercise 1: Evaluate the quality of raw materials& end product (canned food, juice ...)	CELO 1,2,3,4.
	<b><i>B/ Self-study contents:</i></b> (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	<b><i>Chapter 2: Canning technology for fruits and vegetables</i></b>	

	<p><b>A/ Main contents:</b>  <b>1. Theories: (8 hours)</b>  2.1. General principles of fruit and vegetable canning  2.2. Classification of canned fruits &amp; vegetables  2.3. General processing processes in canned fruit &amp; vegetables  <b>2. Practice: (2.5 hours)</b>  Practical exercise 2: Producing canned fruit in sirup/ Producing canned fruit vegetable juice</p>	CELO 1,2,3,4.
	<p><b>B/ Self-study contents: (31.5 hours)</b>  - 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
	<p><b>Chapter 3: Fermentation Technique For Fruit and Vegetable</b></p>	
4-7	<p><b>A/ Main contents: ( 11 hours)</b>  <b>1. Theories: (8.5 hours)</b>  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  <b>2. Practice: (2.5 hours)</b>  - Practical exercise 3: Latic acid fermentation and asesment this process.</p>	CELO 1, 2,3,4.
	<p><b>B/ Self-study contents: (30 hours)</b>  - 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 acohol fermentation for each specific type/group of fruit (grape,domestic apple, lychee, fruit mixture juice...)  - Sensory evaluation/ assesment of product quality (pickled vegetables) by scoring method (color, smell, taste, texture)</p>	CELO 1,2
	<p><b>Chapter 4: Drying technique For Fruit and Vegetable</b></p>	
7, 8	<p><b>A/ Main contents: ( 4 hours)</b>  <b>1. Theories: (4 hours)</b>  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  <b>2. Practice: (0 hour)</b></p>	CELO 1,2,3,4

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