

RQ02032: GENERAL FRUIT TREE

1. General information

- Term: 2
- Credits: **Total credits: 3 (Lecture: 2.0 – Practice: 1.0) - Self-study: 9.0**
- Credit hours for teaching and learning activities:
 - Lectures: 2 sections per week. 2 periods (100 minutes per section).
 - Practice in laboratory/greenhouse: 6 practices (250 minutes for each)
 - Self-study: 135 periods (50 minutes each)
- Department conducting the course:
 - Department: Horticulture and Landscape design
 - Faculty: Agronomy
- Kind of the course:

General <input type="checkbox"/>		Foundation <input type="checkbox"/>		Specialization 1 <input checked="" type="checkbox"/>		Specialization 2 <input checked="" type="checkbox"/>	
Compulsory <input type="checkbox"/>	Elective <input type="checkbox"/>	Compulsory <input type="checkbox"/>	Elective <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>	Compulsory <input checked="" type="checkbox"/>	Elective <input type="checkbox"/>

- Parallel course(s): None
- Prerequisite course(s): None
- Course language: English Vietnamese

2. Course objectives and program learning outcomes

* Course objectives

- Knowledge: The course provides students with knowledge in agro-biological characteristics of fruit trees, propagation, care, harvest and preservation of fruit trees.
- Skills: The course provides students with skills in planting and caring, harvesting, preserving and managing orchards/fruit farms.
- Attitude: The course provides students with attitudes in a high sense of responsibility in work and study when given the opportunity.

* Program learning outcomes

- Program learning outcomes and program's performance criteria to which the course contributes:

Program learning outcomes	Program Learning outcome's performance criteria
After successfully completing this program, students are able to	
Professional knowledge	
PLO2. Apply scientific knowledge and cultivation techniques to produce horticultural products to meet market demand.	2.1. Apply crop science knowledge to build high-tech demonstration farms/ advanced procedures for producing horticultural products to meet market demand.
	2.2. Apply crop farming techniques to build high-tech demonstration farms/ advanced procedures for producing horticultural products to meet market demand.
General skills	
PLO5. Communicate effectively with stakeholders (farmers, clients, professionals, managers)	5.1. Collect, process and communicate information with stakeholders effectively.
Professional skill	

Program learning outcomes After successfully completing this program, students are able to	Program Learning outcome's performance criteria
PLO8. Transfer technical advances and new technologies to horticultural production and landscape management.	8.1. Transfer technical advances and new technologies into horticultural production.
<i>Attitudes</i>	
PLO10. Show a willingness to learn for life, an innovative and creative spirit to respond to rapid changes in science and technology.	10.2. Be willing to learn when given the opportunity to learn, and improve knowledge and capacity.

3. Course description

RQ02032. General fruit tree (Total credits 3: lecture 2 - practice 1 - self-study 9)

The course covers the importance of fruit trees; the situation of fruit tree production in the world and in Vietnam; growth and development characteristics of fruit trees; ecological requirements of fruit trees; nursery and fruit tree propagation methods; planning and designing orchards; management and care of fruit orchards; harvest, preliminary treatment and preservation of fruit.

4. Teaching, learning and assessment methods

CELOs	CELO1	CELO2	CELO3	CELO4	CELO5
Teaching methods					
Lecture	x	x			
Practice			x		
Discussion					x
Essay	x	x		x	x
Assessment methods					
Rubric 1. Practice (20%)			x		
Rubric 2. Essay (30%)	x	x		x	x
Rubric 3. Discussion (10%)					x
Rubric 4. Final exam (40%)	x	x			

5. Student tasks

- Learning attitude: students must attend all lectures in class and practice.
- Prepare for lectures, self-study: students must read or prepare materials related to the lesson in class under the guidance of the teacher.
- Practice and work in groups: students complete practical exercises, write individual reports or in groups under the guidance of teachers.
- Essay and final exam: students must complete the essay and final exam in accordance with the regulations of the University.

6. Text books and references

*** Text Books/Lecture Notes:**

1. Đoàn Văn Lư và cs. (2021). General fruit tree. Publishing house of VNUA.
2. Vũ Thanh Hải và cs. (2022). Specialization fruit tree. General fruit tree. Publishing house of VNUA

*** Additional references:**

3. Graham Seymour and Gregory A (2018). The Molecular Biology and Biochemistry of Fruit Ripening. Wiley-Blackwell Publisher.:
4. Vu Thanh Hai and Pham Van Cuong (2021). Effects of Equal Chemical Fertilizer Substitutions with Organic Fertilizer on the Growth, Yield and Quality of Orange Sanh in Bac Quang - Ha Giang and CS1 in Cao Phong - Hoa Binh. Vietnam Journal of Agricultural Sciences, 19(2), pages 151-160.
5. Vu Viet Hung, Nguyen Thi Tuyet, Vu Thanh Hai, Vuong Sy Bien and Do Thi Hien (2020). Effects of pruning measures on yield and quality of Khe May orange in Huong Khe - Ha Tinh. Science and Technology Journal of Agriculture and Rural development, Vol. 1+2 (3/2020), pages 62 – 68
6. Dinh Hong Duyen, Nguyen The Binh and Vu Thanh Hai (2017). Selection of bacterial strains for degrading litchee postharvest wastes. Can Tho University Journal of Science. Vol. 53b: 61-70

7. Course outline

Week	Content	CELOs
1	Chapter 1: The Introduction	

	<p>A/ Main contents: (2 periods) <i>The theoretical contents: (2 periods)</i> 1.1. Objects, purposes and methods of subject research. 1.2. The position and significance of the fruit growing industry in the national economy. 1.3. The situation of fruit tree production in the world and Vietnam 1.4. Resources and classification of fruit trees 1.4.1. Resources of fruit trees in Vietnam 1.4.2. Fruit tree classification systems. 1.5. Advanced technologies of the fruit tree industry</p>	CELO1
	<p>B/ The self-study contents: (6 periods) - Update statistics on vegetable area, productivity, output, import and export value in the world and in Vietnam. - Refer to the literature and research on the nutritional value and use of fruit trees. - Update information on the current status of fruit tree production in the commercial fruit tree area.</p>	
	<p>Chapter 2: Growth and development characteristics of fruit trees</p>	
1,2	<p>A/ The main contents: (4 periods) <i>The theoretical contents: (4 periods)</i> 2.1. General structure of fruit trees 2.2. Growth cycle and aging and rejuvenation of fruit trees. 2.3. Differentiation and flowering of fruit trees 2.4. Fruit growth and development and influencing factors 2.5. The phenomenon every year bears fruit</p>	CELO1
	<p>B/ The self-study contents: (12 periods) Learn the fruit tree classification systems. Refer to documents and research on the growth and development of fruit trees.</p>	
2	<p>Chapter 3: Ecological requirements of fruit trees</p>	
	<p>A/ The main contents: (2 periods) <i>The theoretical contents: (2 periods)</i> 3.1. Requirements on climatic factors 3.1.1. Temperature requirements 3.1.2. Requirements for light intensity and day length 3.1.3. Rainfall requirements 3.1.4. Winds and other factors 3.2. Soil and nutrient requirements 3.2.1. Land requirements 3.2.2. Requirements for nutrients 3.3. Pests and diseases of fruit trees 3.3.1. Pests of fruit trees 3.3.2. Diseases of fruit trees 3.3.3. Pests and natural enemies in the orchard</p>	CELO1
	<p>B/ The self-study contents: (6 periods) Classification of plants according to climate zones. Refer to documents and research on the influence of environmental factors on the growth and development of fruit trees.</p>	

3, 4, 5, 6	Chapter 4: Nursery and fruit tree propagation methods	
	<p>A/ The main contents: (15 periods) The theoretical contents: (6 periods)</p> <p>4.1. Fruit tree nursery 4.1.1. Meaning and types of fruit tree nursery 4.1.2. Structure of a fruit tree nursery 4.1.3. Design a fruit tree nursery</p> <p>4.2. Propagation methods 4.2.1. Concepts and problems in fruit tree propagation 4.2.2. Sexual propagation (Seed propagation) 4.2.3. Asexual propagation</p> <p>Practical content: (9 periods)</p> <p>Lesson 1: Investigation of fruit tree propagation methods and seedling care techniques. Lesson 2: Propagation of fruit trees by cuttings and cuttings Lesson 3: Propagation of fruit trees by grafting method</p>	CELO1, CELO2, CELO3, CELO5
	<p>B/ The self-study contents: (45 periods) Refer to documents and research on propagation techniques for fruit trees.</p>	
7	Chapter 5: Planning and designing an orchard	
	<p>A/ The main contents: (4 periods) The theoretical contents: (3 periods)</p> <p>5.1. Planning an area for growing fruit trees 5.1.1. Scientific foundation for building a plan 5.1.2. System and validation of data 5.1.3. Proposed regional and sub-regional planning 5.1.4. Development plan, market and product consumption for planning an area</p> <p>5.2. Design of fruit tree farm 5.2.1. Requirements of types for a fruit tree farm 5.2.2. The foundation for designing a fruit tree farm 5.2.3. Fence design of protective plant for fruit tree farm 5.2.4. Structure design of fruit tree in the fruit tree farm 5.2.5. Density and method of planting fruit trees in the farm</p> <p>Essay content: (1 period) Analyze scientific solutions for a problem of fruit tree production and propose technical measures for improvement.</p>	CELO2, CELO3 CELO2, CELO4, CELO5
	<p>B/ The self-study contents: (12 periods) Refer to documents and research on garden design, selection of types, varieties and appropriate planting density for new fruit tree farms. Implement the individual assay</p>	
8, 9, 10, 11	Chapter 6: Management of fruit tree farm	
	<p>A/ The main contents: (14 periods) The theoretical contents: (8 periods)</p> <p>6.1. Pruning for fruit trees 6.1.1. The role of pruning and training canopy 6.1.2. Canopy training for fruit trees</p>	CELO2, CELO3, CELO5

	<p>6.1.3. Pruning for fruit trees</p> <p>6.2. Watering and maintaining appropriate soil moisture</p> <p>6.2.1. The role of water to fruit trees</p> <p>6.2.2. Water requirements of fruit trees</p> <p>6.2.3. Methods of watering and maintaining appropriate soil moisture for fruit trees</p> <p>6.3. Fertilizing fruit trees</p> <p>6.3.1. The role and requirements of nutrients for fruit trees</p> <p>6.3.2. Types of fertilizers and methods of fertilization for fruit trees</p> <p>6.4. Pest control for fruit trees</p> <p>6.4.1. Pests and diseases on fruit trees</p> <p>6.4.2. Principles of pest control in fruit tree farm</p> <p>6.4.3. Pest control measures in fruit tree farm</p> <p>6.5. Other technical managements</p> <p>6.5.1. Intercropping in the fruit tree farm</p> <p>6.5.2. Weed management and control</p> <p>6.5.3. Pre-harvest fruit protection</p> <p>6.6. Discussion: applying appropriate farming techniques for fruit tree production</p> <p><i>Content of practical teaching and discussion: (6 periods)</i></p> <p>Lesson 4: Pruning and training canopy of fruit trees</p> <p>Lesson 5: Fertilization and weed control for fruit trees</p> <p>Lesson 6: Differentiation flower regulation of fruit trees</p>	
	<p>B/ The self-study contents: (42 periods)</p> <p>Refer to documents and research on technical measures applied in fruit tree production.</p>	
11, 12	<p>Chapter 7: Harvest and fruit product requirements</p>	
	<p>A/ The main contents: (4 periods)</p> <p><i>The theoretical contents: (4 periods)</i></p> <p>7.1. Techniques of fruit harvest</p> <p>7.1.1. Determine the appropriate time of harvest</p> <p>7.1.2. Harvest technique</p> <p>7.1.3. Sorting and preserving fruits</p> <p>7.2. Characteristics of fruit products</p> <p>7.3. Product standard systems</p> <p>7.4. Product types and requirements for fruit tree products</p> <p>7.4.1. Fresh fruit products and their requirements</p> <p>7.4.2. Dried fruit products and requirements</p> <p>7.4.3. Frozen fruit products</p> <p>7.4.4. Products processing from fruits</p>	CELO2
	<p>B/ The self-study content: (12 periods)</p> <p>Refer to the literature and research on the effect of technical measures on the appropriate time and quality of fruit at harvest.</p>	