

APICULTURE NH03056

1. General information

- Term: 5
- Credits: **Total credits 2 (Lecture: 1,5 – Practice: 0,5)**
- **Self-study: 6** credits
- Credit hours for teaching and learning activities: 30 hrs
- Self-study: 90 hrs.
- Department conducting the course:
 - Department: Entomology
 - Faculty: Agronomy
- Kind of the course:

Foundation <input type="checkbox"/>		Fundamental <input type="checkbox"/>		Option 1 <input 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): None

2. Course objectives and expected learning outcomes

* *Course objectives:*

- Knowledge: Course provided for students with knowledge in
 - + Morphology – classification of honeybees, honeybee biology, honey plants for bees, pollination of crops by bees,
 - + Techniques in beekeeping, bee diseases, exploitation and processing of bee products.
- Skills:
 - + Manipulation of honey bee colony inspection, seasonal management of bee colonies (bee farm), techniques for creating queens to divide the colony, making new bee bridges, identifying bee diseases, pesticide poisoning, exploiting and managing quality bee products.
 - + Analysis of research results in the field of honey bees
- Attitude: Course provided for students with attitudes in
 - + Having the ability to lead professionally and professionally in bee science; Take initiative in the process of performing assigned tasks; Ability to self-direct, adapt to different working environments; ready for lifelong learning.

* *Course expected learning outcomes*

Notation	Course expected learning outcomes After successfully completing this course, students are able to	PLO performance criteria
Knowledge		
CELO1	Apply bee colony management techniques to build high-tech models/advanced processes for producing horticultural products to meet market demand.	2.2
CELO2	Apply knowledge of beekeeping to the maintenance of the landscape according to artistic and technical standards.	3.4
Skills		

CELO 3	Practical survey to detect problems that need to be researched.	6.1
Attitude		
CELO 4	Willing to learn when given the opportunity to learn, improve knowledge and capacity.	10.2

3. Course description

Brief description of the course: This course consists of Preamble; Morphological characteristics; biology, ecology of honeybees; beekeeping techniques; honeybee diseases and prevention; Reservation and processing of bee products; Genetics and selection of honeybee varieties.

4. Teaching and learning & assessment methods

CELOs	CELO1	CELO2	CELO3	CELO4
Teaching and learning				
Lecturing	x	x		x
Teaching through practical work	x	x	x	x
Group-based	x	x	x	x
Assesment				
Rubric 1. Diligence (5%)				x
Rubric 2. Practical (25%)	x	x	x	x
Rubric 3. Mid-term exam (10%)	x	x		
Rubric 4. Final Exam(60%)	x	x		

5. Student tasks

- Attendance: All students attending this module must attend class at least 75% of the theory periods.
- Prepare for the lecture: All students attending this module should read the reference book for the next lesson before coming to class.
- Thematic exercise: All students participating in this module must register and write a topic on a specific insect object and will present it to the class in the last week of the course.
- Practice: All students attending this module must attend 100% of the practical sessions and complete the report of the exercises. Practice class size 25 students / 5 groups (5 students / group).
- Final exam: All students taking this course must take the final exam

6. Textbooks and references

*** Textbooks/Lecture Notes:**

1. Nguyen Van Long (Ed), Nguyen Huy Tri, Bui Thi Diem, Tran Thi Ngoc (2005), *Sericulture and Apiculture textbook*. University of Agriculture publisher.
2. Pham Hong Thai (2014), *Apiculture textbook*. University of Agriculture publisher.
3. Pham Hong Thai (Ed), Nguyen Thi Lan, Nguyen Duc Khanh (2022), *Honeybee pathology Vietnam National University of Agriculture publisher*

*** Additional references:**

4. Phùng Hữu Chính and Vũ Văn Luyện (1999), *Apis cerana domestic beekeeping techniques in Vietnam*, Agricultural Publishing House
5. Phùng Hữu Chính (2004). Domestic beekeeping techniques for beginners. Labor and Social Publishing House
6. Ngô Đắc Thắng (2003). Bees and domestic beekeeping techniques. Nghe An Publishing House.
7. Ngô Đắc Thắng (2004). Domestic beekeeping techniques. Agricultural Publishing House
8. Thai P H and Toan T V (2018) Beekeeping in Vietnam. Asian Beekeeping in the 21st Century, Springer

7. Course outline

Week	Content	Course expected learning outcomes
1	Chapter 1: Preamble	
	A/ Main contents: (3 hours) Theory: 1.1. The role of honey bees in the economy, environment and people 1.2. History of honey beekeeping	CELO1, CELO2
	B/Self- study contents: (6 hours) + The role of honey bees in the economy, environment and people + History of honey beekeeping + Example	CELO1, CELO2, CELO3, CELO4
2	Chapter 2: Morphological characteristics of honey bees and classification of honey bees	
	A/Main contents: (3 hours) Theory: 2.1. Morphology of honeybees 2.2. Taxonomy of honeybees	CELO1,C ELO2
	B/Self- study contents: (6 hours) + Morphology of honey bees + Taxonomy of honey bees + Example	CELO1, CELO2, CELO3, CELO4
3	Chapter 3: Development	
	A/Main contents: (2 hours) Theory: 3.1. Development of queen, drone and worker bees 3.2. Social behavior and regulation of bee colonies Seminar/Discussion/Project/E-learning: (1 hours)	CELO1,C ELO2

	Presentation of honey bee biology essay	
	B/Self- study contents: (6 hours) The development of queen, colony and worker bees Social behavior and regulation of bee colonies	CELO1, CELO2, CELO3, CELO4
	Chapter 4: Honey bee ecology	
4	A/Main contents: (2 hours) Theory: 4.1. Food source of honey bees 4.2. Plant pollination Seminar/Discussion/Project/E-learning: (1 hours) Presentation of the essay "Plant Pollination"	CELO1,C ELO2
	B/Self- study contents: (6 hours) + Food source of honey bees + Plant pollination	CELO1, CELO2, CELO3, CELO4
	Chapter 5: Advance beekeeping techniques	
5	A/Main contents: (3 hours) Theory: 5.1. Basic beekeeping techniques 5.2. Modern beekeeping techniques Practise lecture /Practis: (8 hours) Practice basic beekeeping techniques	CELO1,C ELO2, CELO3, CELO4
	B/Self- study contents: (6 hours) + Basic beekeeping techniques + Modern beekeeping techniques	CELO1, CELO2, CELO3, CELO4
	Chapter 6: Honey bee pathology	
6	A/Main contents: (2 hours) Theory: 6.1. Virus bee diseases 6.2. Bacterial bee diseases 6.3. Fungal bee diseases Seminar/Discussion/Project/E-learning: (1 hours) Presentation of the honey bee disease and how to prevent it	CELO1, CELO2

	B/Self- study contents: (6 hours) + Pathology of honey bees and prevention + Example	CELO1, CELO2, CELO3, CELO4
	Chapter 7: Harvesting, preserving and processing bee products	
7	A/Main contents: (2 hours) Theory: 7.1. Mining, preserving and processing honey 7.2. Extracting, preservating and processing of fertilizers 7.3. Exploiting, preserving and processing royal jelly Seminar/Discussion/Project/E-learning: (1 hours) Presentation of bee products essay	CELO1, CELO2
	B/Self- study contents: (6 hours) Presentation of bee products essay	CELO1, CELO2, CELO3, CELO4
	Chapter 8: Genetics and Bee Breeding	
8	A/Main contents: (3 hours) Theory: 8.1. Honey bee genetics 8.2. Choose honey bee varieties	CELO1, CELO2
	B/Self- study contents: (6 hours) Genetics and selection of bees	CELO1, CELO2, CELO3, CELO4