

Ministry of Higher Education and Scientific research



**Department of Plant Protection**

**College of Agricultural Engineering Sciences**

**Salahaddin University**

**Subject: Apiculture (Theory + Practical)**

**Course Book – (Year 4)**

**Lecturer's name. Azad H. Saleh. MSc.**

**Academic Year: 2023-2024**

## Course Book

<b>1. Course name</b>	<b>Apiculture</b>
<b>2. Lecturer in charge</b>	<b>Azad H. Saleh</b>
<b>3. Department/ College</b>	<b>Plant protection/Agricultural engineer science</b>
<b>4. Contact</b>	<b>e-mail: azad.saleh@su.edu.krd Tel: (optional) 07504292204</b>
<b>5. Time (in hours) per week</b>	<b>For example Theory: 2 Practical: 6</b>
<b>6. Office hours</b>	<b>Sunday ( 3 hours) and Wednesday (3 hours)</b>
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	<p><b>Lecturer name: Azad Hasan Saleh, born in 1984 Erbil/Kurdistan. Got BSc. Degree in plant protection department 2008-2009, 2<sup>rd</sup> of the 10<sup>th</sup> BSc. Degree in the department. Worked as an Demodulator (teaching assistant) in the plant protection department. And started working as an assistant Lecturer and teaching practical courses to undergraduate students after getting MSc. Degree in 2017 in the same department / salahaddin University / Apiculture .</b></p> <p><b>With taking a course of teaching methods in salahaddin University.</b></p> <p><b>Giving the following course to undergraduate students :</b></p> <p><b>Theory and Practical Apiculture to 4<sup>th</sup> stage students (plant protection department.</b></p>
<b>9. Keywords</b>	<b>Biology and Anatomy of honey bee, Bee Keeping A Novices Guide , The hive and the honey bee, Bee keeping for DUMMIES, Honey bees and Beekeeping and Honey bee diseases and pests.</b>
<b>10. Course overview:</b>	<p><b>Honey bees play a critical role in agriculture such as pollination and they are the most important for humans because produce honey, wax and royal jelly. Collect pollen and propolis. Bee sting use for treatment of arthritis and sclerosis. Honey bees affected by many type of diseases and pests such as Microbial diseases (bacterial disease, fungal disease, viral disease and protozoa disease). Parasitic bee mites or varroa mite. Insect pest such as wax moth, ants, wasps, hornets and small hive beetle. Also</b></p>

**vertebrates such as Amphibians, reptiles, birds and mammals.**

**11. Course objective:**

**In this course we will talk about honey bees in general and the casts of honey bee, life cycle of each casts, the function of each casts then we mention the types of modifications in honey bee workers. In this course also we will talk about the important honey bee equipments. In addition we will talk about wax foundation fixing, honey bee inspection, honey bee feeding, queen rearing and honey extracting.**

**Then we will talk about description the symptoms of diseases and pests on adult bee workers, pupae and larvae. Also the methods of treatments.**

**12. Student's obligation**

**In this part the role of students is as follow :**

**Student's attendance in Lecture and Examination, preparing reports about some important course subjects, writing an assignment on any apiary visiting, doing daily quiz.**

**13. Forms of teaching**

**Various teaching methods are used such as power point (Data show), white board, participating students for answering questions in lecture, explanation videos, and giving home work.**

**14. Assessment scheme**

**1- (15 marks) for the theoretical examinations**

**2- (35 marks) for the practical examinations, and this include:**

**a-(24 marks) for two examinations.**

**b- 5 marks for quizzes,**

**c- 3 marks for Report and participating in laboratory and attentions.**

**d- 3 mark for homework.**

**15. Student learning outcome:**

**On successful completion of the course, students should be able to:**

**1-To know types of bee casts and the life cycle of each it.**

**2-To know the difference between each casts.**

**3-To know the types of feeder and method of feeding.**

**4-To know the type of honey bee hives.**

**5-Learn how they rearing queens and interring to the colony.**

**6-To know the inspection of honey bee colony.**

**7-To determine the common pests and diseases on honey bees.**

**16. Course Reading List and References:**

1- Abou-Shaara, H.F (2014). The foraging behaviour of honey bees, *Apis mellifera*. Faculty of Agriculture, Damanhour University, Egypt. *Veterinarni Medicina*, 59 (1): 1–10.

2- Keller, I., Fluri, P. and Imdorf, A. (2005). Pollen nutrition and colony development in honey bees—part II. *Bee World*, 86(2), pp.27-34.

3- Shower, D. M. and Mousa, k. M. (2016). Effect of brewer yeast diet on the biological activities and the development of mandibular, hypopharyngeal, and wax glands of honeybees, *Apis mellifera* L. (Hymenoptera: Apidae). *Bull. Ent. Soc. Egypt, Econ. Ser.*, 42: 13-22.

**Internet links :**

- 1- <http://en.wikipedia.org/wiki/Honeybees>
- 2- <http://en.wikipedia.org/wiki/Honeybeepests>

**17. Theory Topics:**

**Lecturer's name**

**Lecture 1 Introduction to Beekeeping, Honey Bees, Brief history of Beekeeping development in the world and Social behaviour of Honey Bees.**

**Mr. Azad Hasan Saleh (2hrs)**

**Lecture 2 The importance of Beekeeping, Classification of Honey Bees.**

**Lecture 3 Races of Honeybees. International Races of Honeybees in the World According to the Geographical Location, Members of Honeybee Colony.**

**Lecture 4 Apiary Site Selections and Apiary Management.**

**Lecture 5 Starting a Beekeeping, Dividing and Uniting Colonies.**

**Lecture 6 1<sup>st</sup> monthly exams.**

**Lecture 7 Swarming: Reasons of Swarming, Signs of Swarming and Harms of Swarming, Catching Swarms.**

**Lecture 8 Honey Bee Robbing, Signs of Robbing, Absconding and Migration.**

**Lecture 9 Hive Products, Quality Honey Harvesting and Forms of Honey.**

<p><b>Lecture 10 Laying Workers: Signs of laying workers existence..., protection from the formation of laying workers, How to get rid of laying workers.</b></p> <p><b>Lecture 11 Honey Bee Language: Dances of Honey Bees (Round Dance and Waggle Dance).</b></p> <p><b>Lecture 12 2<sup>nd</sup> monthly exam.</b></p> <p><b>Lecture 13 Honey Bee Enemies: Parasitic Mites and their management, Insect Pests and their management, Vertebrate Pests.</b></p> <p><b>Lecture 14 Honey Bee Diseases: Viral Diseases and their management, Bacterial Diseases and their management.</b></p> <p><b>Lecture 15 Honey Bee Diseases: Fungal Diseases and their management, Protozoan Diseases and their management.</b></p> <p><b>Lecture 16 Scientific Trips.</b></p>	
<p><b>18. Practical Topics (If there is any)</b></p>	<p><b>Lecturer's name</b></p>
<p><b>Lecture 1 What are the Honey Bees? , Classification of Honey bees, The castes of honey bees, the characters and functions of each caste, life cycle of honey bees.</b></p> <p><b>Lecture 2 The external and internal anatomy of honey bees.</b></p> <p><b>Lecture 3 The Honey Bee Hives, types of hive and characteristics of each type.</b></p> <p><b>Lecture 4 Beekeeping equipments, equipments for bee breeding.</b></p> <p><b>Lecture 5 Tools for wax foundation fixing, Tools for beekeeper protection.</b></p> <p><b>Lecture 6 1<sup>st</sup> monthly exam.</b></p> <p><b>Lecture 7 Tools for opening and inspection hives, Tools for honey bee extraction, Other tools.</b></p> <p><b>Lecture 8 The feeders, A-Slow feeders, B- Quick</b></p>	<p><b>Mr. Azad Hasan Saleh (3hrs)</b></p>

<p><b>feeders, Artificial feeding of honey bees, Feeding methods.</b></p> <p><b>Lecture 9 The inspection of honey bee colony, The goals of the inspection colonies, How to inspect colony.</b></p> <p><b>Lecture 10 Queen Rearing and Production, The aim for queen rearing, Methods of Queen Rearing (Natural and Commercial methods.</b></p> <p><b>Lecture 11 Methods for queen introduction in to the colony. 1-Indirect methods. 2-Direct methods.</b></p> <p><b>Lecture 12 2<sup>nd</sup> monthly exam.</b></p> <p><b>Lecture 13 Honey bee diseases: Microbial diseases Bacterial, fungal, viral and protozoa disease.</b></p> <p><b>Lecture 14 Parasitic bee mites (varroa mite).</b></p> <p><b>Lecture 15 Honey bee pests. Insects (wax moth, ants, wasps and small hive beetle).</b></p> <p><b>Lecture 16 Scientific Trips.</b></p>	
<p><b>19. Examinations: Theory</b></p> <p><b>1- Write true or false of the following statements.</b></p> <p><b>2-Define briefly the following terms (langstroth , giant bees , queen substance , AFB , Royal jelly, Drone ,Robbing....etc.)</b></p> <p><b>3-How bees understand each other? And appoint distance and local of food.</b></p> <p><b>4-What are the factors affecting the egg-laying by the queen.</b></p> <p><b>5-Define swarming, what its reasons, harms, and how it can be prevented.</b></p> <p><b>6-What is laying worker, how we can prevented it.</b></p> <p><b>7-Mention the methods of colony dividing, uniting.</b></p> <p><b>8- What is fermentation , Granulation in honey ,what is the causes of it ,</b></p> <p><b>9-Indicate the scientific name &amp; characteristic of these races a- b- c- ...etc.</b></p>	

**10-Enumerate the most important conditions for establishment of commercial Apiary.**

**11-What is the cause of these pests ( Nosema ,paralysis , chalk brood, Efb,..etc .....)**

**12- Fill the blank with the suitable term.**

**Examinations: Practical**

**1. Compositional:**

**-Identify this sample in front of you?**

**-Write the function of?**

**--What are the types of?**

**-What are the differences between .....?**

**-Nurate only .....?**

**2. True or false type of exams:**

**1- Drones do the work inside and outside the colony.**

**(False) Workers.**

**2- The worker produced from fertilized egg.(true)**

**3. Multiple choices:**

**1- Tools for wax foundation fixing:**

**a- Bee smoker      B- Wire crimper      C- Bee brush**

**20. Extra notes:**

**My wish in completing these lectures we will be able establish experts in the honey bees especially beekeeping methods.**

**21. Peer review      پیداچوونہوہی ھاوہل**