



**Department of plant protection.**

**Collage of Agricultural Engineering sciences.**

**University of Salahaddin- Erbil.**

**Subject: Stored Product Pests**

**Course Book – (Year 3)**

**Lecturer's name: Lecture**

**Gazang Taher Omar Phd**

**Waran N. Abdullah Agha MSc**

**Academic Year: 2023/2024**

## Course Book

<b>1. Course name</b>	<b>Stored Product Pests</b>
<b>2. Lecturer in charge</b>	<b>Gazang Taher omar Waran N. Abdullah Agha</b>
<b>3. Department/ College</b>	<b>Plant protection / Agricultural Engineering sciences</b>
<b>4. Contact</b>	<b>e-mail:gazang.omar@su.edu.krd Tel: (optional):07504546799 waran.gha@su.edu.krd Tel: (optional):07504198268</b>
<b>5. Time (in hours) per week</b>	<b>Theoretical (2)hours Practical:( 4)hours</b>
<b>6. Office hours</b>	<b>Tuesday (2) and Thursday (3)</b>
<b>7. Course code</b>	
<b>8. Teacher's academic profile</b>	<p>(Gazang) Date of Birth: 5 May 1982 Place of Birth: Erbil Nationality: Iraqi Marital Status: Married Sex: Female</p> <p>(Waran)Date of Birth: 29 August 1988 Place of Birth: Erbil Nationality: Iraqi Marital Status: Single Sex: Female</p> <p><b>Education:</b></p> <p>(Gazang)BSc. Plant Protection, University of Salahaddin, 2005</p> <p>MSc. Entomology, University of Salahaddin, 2010</p> <p>PhD in Entomology- insect taxonomy, University of Salahaddin, 2020</p>

	<p>(Waran)*B.Sc., Agriculture Plant Protection, University of Salahaddin-Erbil, 2010-2011)</p> <p>*M.Sc., Agriculture Science/Plant Protection, University of Salahaddin-Erbil, 31 October 2016 (<b>Control of Insect Pests that Infect Some Stored Dried Fruits via Using a Microwave and Some Plant Extracts</b>)</p>
<b>9. Keywords</b>	<p><b>Introduction, Stored Product Pests - Sources of infestation with stores pests</b></p> <ul style="list-style-type: none"><li>➤ <b>Detection of insect infestation in stores:</b></li><li>➤ <b>General characteristics of stored products insects</b></li><li>➤ <b>Stored grain insect pest biology</b></li><li>➤ <b>The Major insects of stored grains</b></li><li>➤ <b>Order: Coleoptera</b></li> <li>➤ <b>Order: Lepidoptera</b></li> <li>➤ <b>Storage losses due to Mites and Molds</b></li> <li>➤ <b>Storage losses due to Rodents</b></li></ul>
<b>10. Course overview:</b>	<ul style="list-style-type: none"><li>▪ Few types of insects had adapted to live on seeds and stored products, under storage conditions. Therefore, these insects have the ability to move and reproduce, to protect them or to make new infection.</li><li>▪ During their living and reproduction causes the damage for stored materials. Many of the stored products insects characterize by small size and in ability of disappearance in different depth in grain.</li></ul> <p><b>The importance of studying the subject:</b> Detect for insect infestation in stores.</p>
<b>11. Course objective:</b>	<ol style="list-style-type: none"><li>1- the importance of seeds, monitoring stored grain for insect pest infestations.</li> <li>2- Classification and diagnosis of stores products insects.</li></ol>

### 12. Student's obligation

There are many things important in an academic year: - attendance and completion of all tests, exams, assignments, reports, essays...etc .

### 13. Forms of teaching

Teaching methods are, using data show ways, power point, white board, giving hand note, video reports

### 14. Assessment scheme

Marks distribution of 100%

Test	Mark 50%
1st Exam	12
Quizzes and reports	3
Theory	15
Practicaly	35
Total	50

Final examination (100)

### 15. Student learning outcome:

- Sources of infestation with stored pests.
- detect for insect infestation in stores by one or more symptoms as a following
- General characteristics of stored products insects.
- The accidentalness infestation insects (Order).
- The Major insects of stored grains Order: Coleoptera, Lepidoptera (description, the economic importance...)
- Storage losses due to Mites and Molds.
- Storage losses due to Rodents.

### 16. Course Reading List and References:

Sharma., S. & Choudhary., A. K. (2008). Storage pests management. New Delhi, *Mahman Publication House*, P.1-148.

- Ismail, A. Y. H. (2014). Pests of stored products. Education college Mosul university, biology department. Storage Pest Management. By Sandeep Sharma & Arun K Choudhary Mahamaya Publishing House, 2008.
- Insects of stored products. By David Rees. CSRIO publishing, 2004.
- Common Insect Pests of Stored Food Products. Trustees of the British Museum (Natural History), 1980.

### 17. The Topics: theoretical

Week	Subjects covered
1	Grains and their importance, factors affecting grain storages and standard properties of stored products.
2	Arthropod, Stored product insects characteristic and success, Sexual reproduction
3	Detection of hidden infestation, Techniques for the detection of light infestation, Placement of traps
4	Classification and Biology of some stored products pests, Life cycle, Distribution and status, Host range, Damage symptoms: order Coleoptera
5	1 <sup>st</sup> exam (first hour) + Biology of order Coleoptera (second hour)
6	Classification and Biology of some stored products pests, Life cycle, Distribution and status, Host range, Damage symptoms: Order Lepidoptera
7	Control of stored food insects, Prophylactic control, Contact insecticide
8	Biological controls, pathogenic groups, Plant extracts for insect pest control, Effects of microwaves to control insect pests
9	Storage losses due to mites and fungi, The best way to avoid damage by fungi during storage of food grains are
10	Storage losses due to rodents and control methods
11	Storage losses due to birds
12	

<b>18. The Topics: Practical</b>	<b>Lecturer's name</b>
<p><b>(1<sup>st</sup>)</b> Sources of infestation with stores pests.</p> <p><b>(2<sup>nd</sup>)</b> General characteristics of stored products insects, The accidentalness infestation insects (Order).</p> <p><b>(3<sup>rd</sup>)</b> The Major insects of stored grains (Order: Coleoptera) Rust Red Flour Beetle: 2 species</p> <p><b>(4<sup>th</sup>)</b> Khapra Beetle, Saw-toothed Grain Beetle, Cadelle Beetle, Lesser Grain Borer.</p> <p><b>(5<sup>th</sup>)</b> - Granary Weevil, Rice Weevil, Rusty grain beetle, Flat grain beetle, Yellow mealworm.</p> <p><b>(6<sup>th</sup>)</b> Broad bean weevil, Pea weevil, Bean weevil, Cowpea weevil, Seed beetle.</p> <p><b>(7<sup>th</sup>)</b> Cigarette beetle, Drugstore beetle, Spider Beetle, Dried fruit beetle, Black carpet beetle.</p> <p><b>(8<sup>th</sup>)</b> Order: Lepidoptera: General features, Indian meal moth, Mediterranean flour moth, Meal moth, Almond moth, White-shouldered house moth.</p> <p><b>(9<sup>th</sup>)</b> - Storage losses due to Mites and Molds.</p> <p><b>(10<sup>th</sup>)</b> Storage losses due to Rodents.</p>	
<b>18. Topics (If there is any)</b>	
	<p>Lecturer's name ex: (3-4 hrs)</p> <p>ex</p>
<b>19. Therotical Examination</b>	

*Exam sample:*

- Definitions, such as: Acute poison, Arrhenotoky, ...
- Classification of organism, such as *Tribolium confusum*
- Methods for pest control such as: Biological control
- Mention factors affecting stored product insects, such as: Temperature
- Mention two characteristics of some pests, for instance:

*Rattus norvegicus, Corcyra cephalonica*

**Practical Examinations:**

**1. Questions samples**

**Q1. Definition.....**

**Define stored product, secondary pest.....**

**Q2. Identify this specimen**

**1. Scientific name**

**2. Order**

**3. Family**

**4. Common name**

**Q3. What is the monitoring used to select insect pests of storage .... ?**

**Q4. Write the general features of order .....**

**Q5. fill the blanks with correct words:**

**Both the immature and adult stages of Order: coleoptera are -----?**

**20. Extra notes:**

With the best wishes to the development of Lab. In the. Department.

**21. Peer review**