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**Department of Animal Resources**

**College of Agricultural Engineering Sciences**

**Salahaddin University -Erbil**

**Subject: (Poultry Breeding)**

**Course Book – Forth Class**

**Lecturer's name: - *Assist. Prof Dr. Mohammed S. Abdullah***

 ***Assist. Prof Dr. Hurea S.* *Abdulrazaq***

**Academic Year: 2023/2024**

**Course Book**

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| **1. Course name** | **Poultry Breeding**  |
| **2. Lecturer in charge** | **Assist. Prof. Dr. Mohammed S. Abdullah & Assist. Prof Dr. Hurea S. Abdulrazaq** |
| **3. Department/ College** | **Agriculture College/Animal Resources Department** |
| **4. Contact** | **e-mail: mohammed.abdullah@su.edu.krd****Tel: (07504686486)** |
| **5. Time (in hours) per week**  | **Practical: 2 hours** |
| **6. Office hours** | **Available all days during the week** |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | **B.ch. In animal production (2002)****M.sc. In poultry breeding (2007)****Ph.D. In poultry breeding (2020)** |
| **9. Keywords** | **Poultry Breeding** |
| **10. Course overview:**1. To have knowledge about the origin of the fowl, the theories which explain the origin of the fowl and to have different breeds? The classification of the fowl according to their class, place, and to their production purpose (egg production, meat and dual purpose).
2. To make the students have knowledge about the Mendelian inheritance, type of dominance, the modifications of Mendelian ratio, sex-chromosome, sex-linked inheritance, and lethal genes.The inheritance of skin, plumage and egg colouration.
3. How to use the statistical measurements in poultry breeding, gene frequency and the factors affecting it. Hardey-Weinberg equilibrium, multiple alleles and average gene effect.

To have knowledge about the variance and its components, Estimation of heritability by using different methods as well estimating the genetic parameters including genetic and phenotypic correlation). |
| **11. Course objective:*** **Inform the students about the importance of breeding the fowl, their classification, their conformation type and their production.**
* **The economic useful of some traits which is linked with sex chromosome in isolating males from females.**
* **How to avoid the problems resulted due to the lethal genes.**
* **The benefit expected from the gene frequency and the factors affecting it, as well the multiple allele and the average effect of gene.**
* **Develop the student’s ability in how to collect the data and estimate the genetic parameters.**
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| **12. Student's obligation**The students should be obligated attendance and completion of all tests, exams, quizzes, assignments, reports , essays…etc |
| **13. Forms of teaching**1- PowerPoint.2- Whiteboard. |
| **14. Assessment scheme*** **Examinations:-**
* 1st exam. After 5 lectures
* 2nd exam. After 10 lectures

**Mark Distribution** **Monthly Exam 40 %( Theoretical 25% (5% quiz) + Practical 15%) +**  **Final Exam 60% (Theoretical 40% + Practical 20%) = Final** **Mark 100%.**  |
| **15. Student learning outcome:*** To provide students’ knowledge on origin of the fowl, their species and their classification.
* To let the students know the theories which explain the origin of the fowl and having different breeds .
* To let the students know the gametogenesis and the differences between spermatogenesis and oogenesis (the formation of avian germ cells).
* To know the importance of traits inheritance and types of dominance, and the complementary genes due to gene interaction.
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| 16. Course Reading List and References‌:1. Poultry Breeding (Arabic). (1990). T.H. Hussain and N.M. Ali.2. Genetic of the fowl. (1949). Hutt, B.F. 1st Edition, USA.3. Genetics and Animal Breeding. (1972). I. Johansson and J. Rendel, 1st edition.4. Introduction to Quantitative Genetics. (1989). Falconer, D.S. 3rd edition, USA.5. Understanding Animal Breeding. (1997). Richard M. Bourdon, 1st edition. |
| **17. The Topics:** |

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| **WeeklyLecturesschedule** |
|  | ***subjects*** | ***weeks*** |  |
|  | Origin of the fowl and their species.Theories to explain origin of the fowl.Theories of having different breeds.Classification of the fowl. | **1st week** | 1 |
|  | Classification of the fowl. (Continued).Cytology and reproduction.Spermatogenesis and Oogenesis. | **2nd week** | 2 |
|  | Mendlian Inheritance.Type of dominance.Gene interaction. | **3rd week** | 3 |
|  | Modification of Mendelian ratio:1. One pair of genes.
2. Two pairs of genes.
 | **4th week** | 4 |
|  | Sex chromosome.Sex determination.Sex linked inheritance. | **5th week** | 5 |
|  | The lethal genes:Obligate lethal genes.Facultative lethal genes. | **6th week** | **6** |
|  | Inheritance of skin and colouration and plumage characteristics.Inheritance the colour of eggs.Plumage characteristics.Variation in the structure of feathers. | **7th week** | 7 |
|  | Inheritance of comb shape and feet distortions.Abnormalities of Spurs. | **8th week** | 8 |
|  | Gene frequency, random mating.Hardey-Weinberg law, test the equilibrium. | **9th week** | 9 |
|  | Factors affecting gene frequency:1.Mutation2- Migration | **10th week** | 10 |
|  | SelectionChance (random drift)Multiple alleles.Average gene effect. | **11th week** | 11 |
|  | The variance components.Relationship between relatives. | **12th week** | 12 |
|  | Estimation of heritability:1. Selection experiments.
2. Likeness of relatives.
3. Half sibs.
4. Full sibs.
 | **13th week** | 13 |
|  | Regression Analysis:Intra-sire regression of offspring on dam.Parent-offspring means.Genetic parameters. | 14th week | 14 |

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| **18. Examinations:****Sample of questions in Poultry Breeding – Animal Resources Department****Q1. Define: Melanin, Albinism, Silky plumage, Non-recurrent mutation, Pencilling feather, Double Spur, Heritability, Heterosis, and Average effect of gene?****Q2. Fill in the blank with the suitable word:****a. The origin of recent domestic fowl is ………… ………… .****Q3. Answer the following:** **a. Draw chart to explain fertilization?** **b. There are two theories to have different breeds, what are they? Explain one of them?****Q4. a. Classify the fowl around the world according to their class? List the breeds of each class?** **b. Explain the economic useful of Barred plumage trait with showing the mating to produce F1 and F2?****Q5. What will be the results of F1 and F2 from mating fowls with Pea and Rose comb?Q6. List the properties of Normal Distribution?****Q6. What do you know about?****a. The economic useful of silver and gold plumage?** **Q7. Calculate the heritability (h2) from the following data recorded on sires and their progenies weighted at 8-weeks of age:****Q8. In a trial using nested design, the results of Analysis of Variance and Covariance of body weight of chicks at 4 and 8 weeks of age were:****Source of Variation Mean Squares and Mean Cross Products** **Body weight at 4-weeks Body weight at** **4 \* 8 weeks Body weight at 8-weeks****Sires 302.1 109.15 616.0****Dams 209.36 83.26 481.3****Progeny 118.00 47.48 350.6** **K1=K2=13, K3=20****Calculate h2 for each trait, and genetic (rg), Phenotypic (rp), and environmental correlations (rE) between the two traits?****Q9. If you have a flock of local strain produced 18 eggs as a monthly average and crossed with exotic strain produce 24 eggs, their progeny produce 23 eggs. Calculate the heterosis, what is the type of heterosis?****Q10. Calculate RAB, RCD, RCG, REG, FC, FD and FE from the following chart:** **A C** **G E** **B D** |
| **19. Peer reviewپێداچوونه‌وه‌ی هاوه‌ڵ** This course book has to be reviewed and signed by a peer. The peer approves the contents of your course book by writing few sentences in this section.*(A peer is person who has enough knowledge about the subject you are teaching; he/she has to be a professor, assistant professor, a lecturer or an expert in the field of your subject).* |