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**DEPARTMENT OF ANIMAL RESOURCES**

**COLLEGGE OF AGRICULTURE**

**UNIVERSITY OF SALAHADDIN-ERBIL-IRAQ**

**FARM ANIMAL ECOLOGY**

 **(YEAR- 2) COURSE BOOK**

**DR. TAHSIN SADY HUSSEN**

**ACADEMIC YEAR: 2022/2023**

**Course Book**

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| **1. Course name** | **FARM ANIMAL ECOLOGY** |
| **2. Lecturer in charge** | **Dr Tahsin Sady Hussen** |
| **3. Department/ College** | **Animal Resources,** **College of Agriculture** |
| **4. Contact** | **E-mail:** **tahsinbaker1997@gmail.com** **Tel:07504682883** |
| **5. Time (in hours)** **per week**  | **Theory: 2** **Practical: 3**  |
| **6. Office hours** |  **3 Hours** |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | I am a PhD holder in animal husbandry (poultry environment) for the year 1986 at the University of (ION IONESCU DE LABRAD- IASI- ROMANIA) I was employed in the Institute in 1989 and in 1992 transferred to the University of Dohuk and at that time I was assigned to establish the College of Agriculture in (Sumael -Dohuk) and then in the year 1993 under the social condition I transferred to (Salahaddin University Faculty of Science) then In 1996 assigned to establishment the Faculty of Agriculture in Slahdin University. I got position of Associate Dean and the decision of the Council of the College and in 1997 I traveled to Britain and then I start back my job at the College of Agriculture in 2010, the Department of Animal Resources as PHD. Because we needed research in (poultry breeding) we decided to Reconstruction, repair and renovation poultry Hall in Grdarash farm so we started to do about six researches with Our PHD colleagues and about ten M.SC colleagues.   |
| **9. Keywords** | Animal ResourcesEnvironment – Ecology - Heat - Radiation Solar – Light Intensity Pollutants – House Polluting |
| **10. Course overview:** The environmental elements for animal resources projects is of great importance such temperature , humidity, ventilation, lighting….etc all these things whether from the surrounding environment or internal within the animal houses are all affecting the animals health positively or negatively , affecting feed intake ,reproduction and so the productivity of farm animals. |
| **11. Course objective:****. The basic objectives of teaching farm animal ecology as follows:** Teaching the students how the environmental elements affects the various animal activities including nutrition ,production performance and the most important thing how to control these environmental elements and make it positive and adapted to the farm animals requirement for the purpose of providing comfort in the process of eating and living without stress in order to ensure the high production performance with economic cost. |
| **12. Student's obligation**  The student commitment to the presence in the lecture before entering the lecturer.Commitment and focus silently during the performance of lectureCommitment exam after every four lectures and two reports must be submitted within one year. |
| **13. Forms of teaching**Binding teaching Data show whiteboard |
| **14. Assessment scheme****Mark distribution : 100%****Monthly Exam 40% (theoretical 25% + practical 15%) +** **Final Exam 60% (theoretical 40% + practical 20% )****Quizzes: 3 Mark** |
| **15. Student learning outcome:** We with students should make every effort to improve skills as much as possible and heavily focused on technical knowledge of different aspects of farm animals ecology.We should be familiar with as many of these aspects.  |
| **16. Course Reading List and References‌:**

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| --- | --- | --- | --- |
| **Reference Title** | **Author(s)** | **Year** | **Library Code** |

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| --- | --- | --- | --- |
| **Mousil Univ** | **1992** | **By Dr.AkramT.Y.Khafaf** | **FARM ANIMALS ECOLOGY.**  |
| **99 S**  | **2000**  | **Robert l.smith,** | **Elements of Ecology,4th edition.**  |
|  | **2005** | **William P.C,MarY Ann** | **Environmental scince,8ht edition** |
|  | **1996** | **Michael Allaby** |  **Basics of Environmental Science 2nd** |
|  **44 S**  | **2000** | **Peter J Jarvis** | **Ecological Principles &Environmental Issues** |
| **39 S**  | **2005** | **William P.C.Mary Ann** |  **Environment Science 8 edition**  |
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| **17. The Topics:**

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| **COURSE OBJECTIVE** | **COURSE SUBJECT** |  |
|  Definition of ecology, weather, macroclimate, microclimate,Animal distribution rules on our planet, factors affecting physical weather in animal ecology, factors affecting the temperature. | Definition of Ecology | **1** |
| **Sources of heat in animal's body, heat loss, heat transfer, solar radiation, factors affecting the evaporation, humidity, humidity and the transfer of diseases, the affected of humidity on poultry, the absolute humidity, relative humidity, dew point, discomfort index.** | **Sources of heat in animal's body** | **2** |
| The light, differences in light intensity, photoperiod, the affect of indirect light, solar radiation and spectrum, photo synthetically active radiation, the spectrum colors. | The light, differences in light intensity | **3** |
| Ultraviolet radiation, infra red radiation, the blue color of the sky, the white color for the clouds, the red and yellow color for the dusty sky, the blue color of the sea, the green color of the plant leaves. | Ultraviolet radiation, infra red radiation | **4** |
|  The importance of the light for poultry, the air currents, atmospheric pressure, factors +affecting the atmospheric pressure, air components in animal houses.Health importance of air components, oxygen, ozone, nitrogen oxides, carbon dioxide, air pollutants inside the animal houses. | **First Exam**The importance of the light for poultry. | **5****6** |
|  The health importance for these pollutants, carbon monoxide, ammonia, sewer gases, H₂S ,CH₄ , solid pollutants, pollen grains ,dust, sands, sources of bacterial pollutions, animal litters. |  Health importance for these pollutants | **7** |
| **To learn from this lesson the important of cleaning, disinfect and fumigate in poultry house:-****- cleaning and disinfect the equipment, floor, wall, selling, out door and around the house by water and detergent.** **-fumigate the house.** |  House air pollution  | **8** |
| House air pollution with bacteria, the rule of the air for transferring disease, poultry wastes and environmental pollution, animal watering, the biological functions of the water in the body, water physiology in th | **-Second Exam**-Factors affecting feed intake,  | **9** |
| **l** The precipitations, liquid precipitation, solid precipitations, snow, hailstone, dew, fog, the affects of precipitations on animals. The relationships of animals with the dry climates, the animals division according to their acclimation to the dry climates.The thermal balance, fort knox equation, the heat gain sources because of the metabolic activities of the internal organs , the hormones of the thyroid glands, adrenal medullary hormones. Stress in the Animals, stress factors , thermal regulation, thermal neutral zone, voluntary behavioral adjustments, involuntary behavioral adjustment. | The precipitationsThe relationships of animals with the dry climates, the animals their acclimation The thermal balance. Stress in the Animals | **1o**111213 |
|  Temperature perception, peripheral thermo receptorS, the animal behavior in case of low temperature, disturbances in thermoregulation. | Temperature perception. | **14** |
|  Sun stroke, heat cramp, fever, feed levels and thermal regulation, gross energy, gross energy divisions, energy measuring , bomb calorimeter, carbohydrates, lipids, proteins. |  Sun Stroke, Heat Cramp | **15** |

 | **Lecturer's name****Dr:** **Tahsin Sady** Dr.Tahsin Sady07/10/2017**Dr.Tahsin Sady****14/10/2017****Dr.Tahsin Sady****21/10/2017****Dr.Tahsin sady****28/10/2017****Dr.Tahsin Sady****04/11/2017****Dr.Tahsin Sady 11/11/2017**Dr. Tahsin sady18/11/2017**Dr.Tahsin Sady** **25/11/2017****Dr.Tahsin Sady****02/12/2017**Dr.Tahsin Sady 09/12/2017Dr.Tahsin Sady16/12/201`7Dr. Tahsin Sady23/1`2/2017Dr. Tahsin Sady30/12/2017Dr. Tahsin Sady06/01/2018Dr. Tahsin Sady13/01/2018 |
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| **18. Practical Topics (If there is any)** |  |
| Visit and watch meteorological weather station in Erbil | Dr. Tahsin Miss Nizal iass.Miss Sawdat,M  |
| **19. Examinations:**  **(20 mark) Q1: Explain the following phenomena:****1- The blue color of the sky.****2- The white color of the clouds.****3- The green color of the plant leaves.****4- The red and yellow color for the dusty sky.** **5- The blue color of the sea.****Q2: Choose the right answer for the following:- (16 mark)** **(1)Bergman rule: depends on the size of the body of animals, in general the animal of the cold climates is --------------- than animal lives in hot climates.****a-(smaller) b-(medium) c- (bigger)** **(2 Highlands temperature decrease in general rate of half a degree Celsius per -----meters high above the ground. A-(100)m B-(50)m C-(30) m D-(10)m.**  **(3) The sun radiation energy is coming directly on the skin of animals, ,the energy received by the cattle from the sun light it is ------ times as much metabolic energy.**  **A-(2) times B-(3) times C-(4) times D-(5) times** **(4) Excess humidity more than ---------% helps for spreading parasites and respiratory diseases** **A– 20% B –40% C– 60% D- 80%**  **(5) The best humidity in the poultry houses is between (-----to ------)%.** **A(20-30%) B (50-70)% C (80-90)%.**  **(6)Infrared light (IR): Electromagnetic radiation with a wave length between (-----to-----)nm .** **a(700-100000) b(500-10000) C(400-1000).**  **Q3: Fill in the blanks with correct answer (16 mark)** **(1 Glogers Rule:-Animals of the hot climate have much of melanin pigments like -------color and -------color pigments.** **(2 Pollution: The greater the contamination of atmospheric by smoke and ------- and the presence of -------------, the lower arrival of solar radiation to the ground.** **(3) Heat loss:The body loses excess energy needs through several channel, animals may loss energy in small amounts with --------- and ----------.****(4) Temperature: with higher temperature the evaporation will ----------.** **(5) High humidity of -------% helps feathering.** **(6) - (UV)Ultra violet radiation: wave length (---- to------) nm.****Q4: Answer with ( / )or ( X )for the following sentences and correct the mistakes.** **(24 Mark)** **(1) Law of Allens: animals in the tropics climate that distinguish is the length of tail and the ear lobes, legs and beak in birds which it can be long and large in warm climate areas .** **(2) Law of Wilson: The fatty tissue deposited in form fatty layer just under the animals skin, is more presence in warmer environment climates.**  **(3) - Thermal reflection in poultry: The body of the bird has the ability to produce radiant energy estimated 8.5—9.5kcal per 1kg body weight.**  **(4)Heat transfer by conduction: heat moves from warm bodies to the cold bodies so the animal loses its heat through contacts with warm walls and ground.** **(5) Salinity: every increase in salinity by 1% leads to decrease of evaporation rate** **by 10%.** **(6) . Photo period farm animals like poultry sheep and cattle influenced remarkably with the changes of photoperiod.** **Q5: Defined the following: (24 Mark)** **1- Ecology.**  **2- Macroclimate.**  **3- Albedo**  **4- Evaporation.**  **5- Photo period lux.** **6- Absolute humidity.****Pro.Asis.Dr.Tahsin** ---------------------------------------------------------------------------------------------------- **Answer:**Q1: 1-Molecules of gases in the atmosphere layer upper stratosphere spread the short wave colors and thus gives blue colors to the sky2-Water vapor spreads all the light colors and gives the white appearance to the clouds.3-Plant leaves appear green because they strongly reflects the green color and strongly absorbs the red, blue, violet colors.4-Dust spreads the long waves and this gives the red and yellow colors to the sky.5-In clear water the colors yellow, Green, and violet disappear just the blue color waves stays which pays the appearance of the blue color for everything in the deep water.Q2:1. Bigger 2- 100 meter 3- 3time 4-80% 5-(50-70)% 6- (700-100000)

Q3:1. Red color yellow color
2. Smoke, dust, water vapor
3. Feces urine
4. Will increase
5. 70%
6. 100-400nm

Q4:1. T
2. X Cold environment
3. X 5.5 – 6.5 kcal
4. X Cold walls and ground
5. X 1% Evaporation rate by 1%
6. T

Q5:1-Ecology the science of the relationship between organism and their environment.2-Macroclimate the general climate over a large geographic area.3-Albedo ration of reflection of radiation to total radiation striking the body.4-Evaporation for the animals is important and main way to lose excess heat from the body of animals in the hot climate.5- Photoperiod :- Amount the light received by animal from the sun inperiad between sun rise and sun set.6- Absolute humidity:- the mass of water vapor in a unit volume of air.. |
| **20. Extra notes:**  |
| **21. Peer review پێداچوونه‌وه‌ی هاوه‌ڵ**  |