First stage

College of Agriculture engineering science

University of Salahaddin–Erbil

Subject: (Principle of Statistics)

Course Book – First Class

Lecturer's name:- Dr. Muslim Rasul A. Khoshnaw

Academic Year: 2021/2022

Course Book

1. Course name	Principle of Statistics
2. Lecturer in charge	Dr. Muslim Rasul A. Khoshnaw
3. Department/ College	First stage/College of Agriculture engineering science
4. Contact	Muslim.khoshnaw@su.edu.krd
5. Time (in hours) per week	2 hours
6. Office hours	Available all days during the week
7. Course code	
8. Teacher's academic profile	https://academics.su.edu.krd/muslim.khoshnaw
9. Keywords	Principle of Statistics

10. Course overview:

Definition, scope and limitations of Statistics. Different types of variables. Frequency distribution: construction and graphical representation. Measures of location and variation and shape characteristics of curves.

Random experiment, outcome, sample space, events, mutually exclusive, equally likely, independent and dependent events. Mathematical and statistical definitions of probability, compound and conditional probability. Additive and multiplicative laws of probability. Random variable, probability distribution. Probability function. Binomial, Poisson and Normal distributions.

Simple correlation and regression. Scatter diagram, Pearson's correlation coefficient with its properties, and least squares method for fitting regression line. Properties of regression coefficients.

11. Course objective:

- **Inform the students about the importance of statistics in the experiences of animal production and developing their skills in planning and implementation of agricultural experiments.**
- **How to set testing hypotheses, and comparison between the levels of different factors.**
- **Develop the student's ability in how to collect, analyze data statistically and discuss their results.**

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 4 lectures

✓ 2nd exam. After 9 lectures

Mark Distribution
Monthly Exam 15 %
Practical exam 35 %
Final Exam 50 %

15. Student learning outcome:

- Improve their ability in collecting data and statistical techniques.
- To let the students know the differences between population and sample and between observations, variables and traits.
- Application of some examples about this subject.
- Teach the students on testing the significance of differences for one mean, percent, two means and two percentages of a population or samples using different methods.
- Learn students on knowledge about correlation and regression between two characters and interpretations of result.

16. Course Reading List and References:
1. Introduction to Statistics (Arabic), K.M. Al-Rawi.
2. Miroslav \kaps & William R. Lamberson, 2004. Biostatistics for Animal Science
3. Riyanti Boyd & Natalia Casper, 2021. INTRODUCTORY STATISTICS. 4th Edition.

17. The Topics:

Weekly Lectures schedule			
	weeks	*subjects*	
1	**1st week**	1. **Statistical symbols and terminology.** 2. **Statistics definitions.** 1. **The population and the sample.** 3. **Variables and traits**	
2	**2nd week**	- Some formula for summation and multiplication processes . 2. Statistical operations and calculations. 3. Hypothesis testing and confidence limits.	
3	**3rd week**	Methods of presenting the data. 1. Summarization and Characterization of Data. 2. Measures of Central Tendency:	

		a. Mean	
		b. Median	
		c. Mode	
4	**4th week**	1. Measures of Dispersion: Variance , Standard deviation , Standard error , The range and Coefficient of variation .	
5	**5th week**	The Probability: 1. Rules of simple events and their counting. 2. Compound events.	
6	**6th week**	The Distributions: 1. Bionomial Dist. 2. Continuous Dist. a. Normal Dist. b. Standard Normal Dist. c. t-Dist , X2 Dist and F- Dist .	
7	**7th week**	1. The hypothesis. 2. The statistical decisions. 3. Hypothesis testing using t, X2 or Z dist. a. For one mean	
8	**8th week**	**b. For one percent.** **c. For two means.**	
9	**9th week**	d. For two percents. e. More than two means.	
10	**10th week**	1. The importance of covariation. 2. Calculating covariance.	
11	**11th week**	Calculating the correlation	
12	**12th week**	1. Calculating the regression	
13	**13th week**	The importance of regression.	

14	**14th week**	1.	Matrix Algebra	
		2.	Matrix Operations:	
		a.	Matrix Addition.	
		b.	Matrix Subtraction.	
		c.	Matrix Multiplication.	

18. Examinations:

Sample of questions in Bio-statistics – Animal Resources Department

Q1. Define: Variable, Sample, quantitative variable, discrete variable and population?

Q2. List the methods of collecting data?

Q3. Consider you have the following data represented weaning weight of Karadi lambs (kg):

Calculate the Mean, Mode, Median, Standard Error and CV?

Draw the normal distribution and standard normal distribution of yield with showing a confident limit of 68%, 95% and 99%?

Q4. Complete the following frequency table and then present the data in Graphics?

Q5. If the success percent of student in a secondary school in physics, chemistry and mathematics were 65%, 90% and 80% respectively. What will be the probability to have:

Q6. List the properties of Normal Distribution?

Q7. What are the three importance of covariation?

Q8. Average body weight of Karadi lambs in a sample taken from flock (A) consist of 51 lambs was 30 kg with variance 16 kg2. Also average body weight of lambs in a sample from flock (B) consist of 41 lambs was 26 kg with variance 9 kg2. Test the hypothesis μX= ……………….. ?

Q9. Suppose that the real percentage of lamb mortality in a flock is 20%. Test this hypothesis by using a random sample of 120 lambs and 23 lambs were dead?

Q10. In a flock of Awassi sheep, the supposed percent of twins was 30 %. Test this hypothesis using X2 if the real number of twins was 32 in a sample of 120 lambs (32 twins and 88 single lambs)? Tabulated X2 (P<0.05) with d.f. 1, 2, and 3 were 3.84, 5.99 and 7.81 respectively?

Q11. Data in the following table were dam weight at lambing and birth weight of their progeny?

1.   Calculate phenotypic correlation between the two traits?

2.   Calculate regression coefficient of birth weight on dam weight?

19. Peer review   پێداچوونەوەی هاوەڵ

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).