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**Department of General Science**

**College of Basic Education**

**Salahaddin University- Erbil**

**Subject: Educational Statistics**

**Course Book Second Semester –1st Stage**

**Lecturer's name: Ms. Zhyan R. Ali**

**Academic Year: 2022/2023**

**Course Book**

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| **1. Course name** | Educational Statistics  |
| **2. Lecturer in charge** | Ms. Zhyan R. Ali |
| **3. Department/ College** | General Science / Basic Education |
| **4. Contact** | **e-mail : zhyan.ali@su.edu.krd****Tel: ()** |
| **5. Time (in hours) per week**  | **Theory: 3** |
| **6. Office hours** | **3** |
| **7. Course code** |  |
| **8. Teacher's academic profile**  | 1) B.Sc. in Mathematic. Mathematic Department- College of Education- Salahaddin University- Erbil in 1997.2) M.Sc. in Mathematic. Mathematic Department- College of Science - Salahaddin University- Erbil in 2009. |
| **9. Keywords** | **Statistics, Sample, Types data collection, frequency Tables, Measures of central tendency, Correlation, t-test ... etc.** |
| **10. Course overview:**This course introduces you to the fundamentals of statistics. It is designed primarily for educational professionals, particularly instructional designers and developers. The course is also useful to anyone wanting a brief introduction to statistics, such as second or (first) -year education students about to take statistics as part of their graduate knowledge. It is also a good refresher for educational students who will studies statistics. The emphasis in this course is learning statistics by applied educational statistics. In many situations large amounts of numerical data is available which requires statistical techniques for analysis. There is the various statistics mean and how they are derived. It is important that you go through the course in sequential order to build at the start of the course will slowly grow and become more complex. The application of statistical methods is very extensive and is used in all branches of Science and Technology, Industry, Business, Finance, Economics, Sociology, Psychology, Education, Medicine etc. Inferential Statistics which covers those statistical procedures used to help draw conclusions or inferences about a population on the basis of a sample of data collected from the population. Sampling is necessary because measuring every member of a population is time-consuming and expensive, impractical or impossible.The reason this course is for "mere human being" is because it's designed for people who aren't, and don't want to be, statisticians or mathematicians. Instead, it's designed for ordinary people with ordinary math skills who want to get to the point of it all especially who become teacher in future or studies higher.   |
| **11. Course objective:** The reason this course is for "mere human being" is because it's designed for people who aren't, and don't want to be, statisticians or mathematicians. Instead, it's designed for ordinary people with ordinary math skills who want to get to the point of it all especially who become teacher in future or studies higher |
| **12. Student's obligation** Student readiness is very important to learn and get note about the lesson, because you are amenable to the lesson.Student should bring **calculator** to class every day lesson. |
| **13. Forms of teaching**White board and Data show to view the headlines, definitions and tables |
| **14. Assessment scheme**Test =30Quiz = 10the total = 40 and final exam =60 |
| **15. Student learning outcome:**1. Given a set of raw data, identify the individuals and the variables. 2. Given a variable, determine whether it is categorical or quantitative. 3. List which graphical methods (pie charts, histograms, etc.) are appropriate for categorical and for quantitative variables.4. Given a histogram, determine the number of individuals in a particular range. 5. Given a set of raw data, calculate the principle summary statistics (mean, median, quartiles, inter-quartile range, variance, standard deviation) by hand and using appropriate software. 6. Explain how the mean and median are related for different shapes of a distribution (skewed left, skewed right or symmetric). 7. List the following characteristics of the standard deviation a. The standard deviation must be greater than or equal to zero. b. **When** standard deviation is equal to zero, there is no spread – every number on the list if the same.8. Given a correlation coefficient, determine if it is legitimate. That is, determine if its value is between -1 and 19. Given the means, standard deviations and correlation of variables x and y, calculate the slope and intercept of the regression line by hand.10. Explain the relationship between the slope of the regression line and the correlation coefficient.11. Given the least squares line and a value of x, calculate the predicted value of y.12. Given a study, explain in context that the regression method is used to estimate the average value of y when you know x and that individual values will vary around the predicted value.13. describe discrete data graphically and compute measures of centrality and variation 14. compute correlation coefficient and regression lines. |
| **16. Course Reading List and References‌:****Main References:*** **Alan Agresti, ((Statistical methods for the social sciences)), third edition**
* **Jay L. Devore ((Probability and Statistics)) sixth edition**
* **محمد صبحي ابو صالح (( مبادىء الاخصاء)) 2007، جامعة اليرموك**
* **خاشع محمود الراوي ((المدخل الى الاحصاء)) ،2000 ، جامعة الموصل**
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| **17. subject** |  |
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| **Week** | **Subjects** |
| 1 | Definition of Statistics, types of statistics (Descriptive and Inferential statistics), Variables The types of Data, Qualitative and Quantitative variable , Methods of collection the data ( Census, samples) |
| 2 | Population, finite , infinite, Homogenous, non Homogenous population, , Sampling,The types of Sampling Techniques, types of Random Sampling, (simple, Systematic, Stratified,)  |
| 3 | presentation of data, Graphical, frequency, Bar chart, Pie chart, , Frequency distribution for Quantitative Data |
| 4 | The general rules for creating a frequency table, Example |
| 5 | Centre of class(midpoint), relative frequency, Percentage relative frequency , Cumulative frequency distribution, |
| 6 | Class boundaries, general presentation for quantitative Data,( frequency histogram, frequency polygon, frequency curve,  |
| 7 | Measures of central tendency , Arithmetic mean for ungrouped Data and for frequency distribution ,Weighted average |
| 8 | , the median for ungrouped Data, and for frequency distribution( discrete and continuous) , the mode for ungrouped Data, and for frequency distribution( discrete and continuous) |
| 9 | Measures of Dispersion (Variation) ,the range, the mean deviation ,The variance and standard deviation |
| 11 | correlation |
| 12 | Pearson’s correlation coefficient, spearman’s rank correlation method |
| 13 | Regression, simple linear Regression |
|  |  |

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| **18. Practical Topics / Non** |  |
|  |  |
| **19. Examinations:** (1) find the spearman’s rank correlation coefficient from the following table.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | 90 | 73 | 56 | 73 | 89 | 91 | 65 | 73 |
| Y | 4 | 5 | 6 | 3 | 7 | 4 | 2 | 5 |

(2) find the correlation coefficient from the following data.

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| X | -1 | 4 | -3 | -7 | 0 | 2 | 5 | 9 |
| Y | -3 | 5 | -6 | 3 | -1 | 4 | 7 | 3 |

(3) find the value of a and b use the least squares method from the following linear regression yi=a+bxi+ei.(4 Find the mean deviation, variance, and median from the following frequency distribution table

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| classes | 20-24 | 25-29 | 30-34 | 35-39 | 40-44 | 45-49 |  |  |
| frequency | 4 | 2 | 10 | 5 | 9 | 6 |  | ∑fi=36 |

(5) marks of 8 students in math and statistic are given as:

|  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 68 | 72 | 85 | 70 | 69 | 76 | 75 | 80 | Math |
| 70 | 80 | 88 | 67 | 68 | 72 | 65 | 85 | Statistic |

Find the fitted line when a mark of a student in math is 90, what is the most likely mark in statistic?And Find the fitted line when a mark of a student in statistic is 70, what is the most likely mark in math?(6) Find the **rank correlation coefficient** from the following data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| X | 56 | 80 | 90 | 61 | 82 | 57 | 44 |
| Y | Good | Very good | medium | Accepted | Medium | good | very good |

(8)from the following data Construct the frequency table17 21 26 31 36 41 46 51 57 23 27 32 37 42 47 53 28 33 38 43 48 31 39 44 37 (9) find variance from the following data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Class | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 |
| Freq. | 1 | 2 | 3 | 4 | 5 | 3 | 2 |

 (14) find the standard degree from the following data Xi= 2 5, 4, 2, 8, 6, 4 ,7 ,8, 1, 5, 4 then find the length of child if the length of mam=172 and length of dad=180.(17)find relative frequency distribution from the following data

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Class | 40-44 | 45-49 | 50-54 | 55-59 | 60-64 | 65-69 | 70-74 |
| Freq. | 1 | 2 | 3 | 4 | 5 | 3 | 2 |

(19) represent the following data by bar graph

|  |  |
| --- | --- |
| **frequency**  | **Blood group**  |
| 16  | O  |
| 18  | A  |
| 4  | B  |
| 2  | AB  |
| 40  | Total  |

(20) What is the statistics? (21) talk about the types of statistics. (22) . Where used the statistic?(23) defined census method, and count its types.(24) defined raw and group data with example(25 ) given an example about simple table and complex table |
| **20. Extra notes:** |
| **21. Peer reviewپێداچوونه‌وه‌ی هاوه‌ڵ** **Mr DLER MUSTAFA KHIDHR Mrs ZHYAN ALI** |