

Kurdistan Region Government

Ministry of Higher Education and Scientific Research

Erbil Polytechnic University

**Module (Course Syllabus) Catalogue**

**2023-2024**

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| **College/ Institute**  | **Shaqlawa Technical College** |
| **Department** | **Medical Laboratory Technology-** |
| **Module Name** | **Biostatistics** |
| **Module Code** | **BIO603** |
| **Degree** | **Technical Diploma Bachelor High Diploma Master PhD** |
| **Semester** | **6th**  |
| **Qualification** | **Diploma/ Bachelor** |
| **Scientific Title**  | **Lecturer** |
| **ECTS (Credits)** | **4** |
| **Module type** | **Prerequisite Core Assist.** |
| **Weekly hours** | **3** |  |
| **Weekly hours (Theory)** | **(1)hr Class** | **(70)Total hrs Workload** |
| **Weekly hours (Practical)** | **(2)hr Class** | **(70)Total hrs Workload** |
| **Number of Weeks** | **14** |
| **Lecturer (Theory)** | **Zhwan Dilshad Abdullah** |
| **E-Mail & Mobile NO.** | **zhwan.dlshad@epu.edu.iq** |
| **Lecturer (Practical)** | **Zhwan Dilshad Abdullah** |
| **E-Mail & Mobile NO.** |  |
| **Websites**  |  |

**Course Book**

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| **Course Description** | This course, which is proposed for third year Medical Laboratory Technology students at undergraduate level, is designed to teach basic data analysis methods and to demonstrate applying data analysis techniques through SPSS. The course will demonstrate how to decide on appropriate methods for summarizing and analyzing empirical data and presenting statistical results. The course will also highlight basic features of SPSS such as data manipulation (loading and creating data files, how to manage, manipulate and expand on existing data files), performing statistical analyses and working on the output (interfacing to other software). The course is divided in to theoretical and practical units. The course will alternate between lectures and practical lab sessions where students will be encouraged to apply the material while learning to program in the most sophisticated statistical software package SPSS. The first part of this course focuses on two main topics; first students are oriented to an introduction to SPSS program and how to examine data sets, which will be taught parallel to applied statistics and statistical inference; second will revise the quantitative techniques to summarize and present different types of data with applications. The second part focuses on statistical methods and shows how to perform a number of statistical tests using SPSS to solve real life problems. Topics addressed will include statistical tests (parametric and non-parametric), correlation, simple linear regression and multiple regression, analysis of variance for comparing means using ANOVA, categorical data analysis, using SPSS. |
| **Course objectives** | The main objective is to help undergraduate students gain a thorough understanding of applied statistics and learn how to explore and handle data in a systematic manner using the most popular professional social statistics program (SPSS) in the market today “Statistical Package for the Social Sciences (SPSS) with practical applications for statistical methods. It is much easier to apply statistical methods using such software, SPSS, were the accuracy of computations is greatly improved. Another objective for the course is to give the student good understanding of the role of statistical analysis and its methodology in solving problems and help in applying theoretical concepts they have learned to solve real-world problems through analysing data, interpreting the results and communicating findings. |
| **Student's obligation** | * **Student's obligation**

Attendance in lecture is expected. You are responsible for everything covered, mentioned, discussed and displayed in class. If you miss a class, get a classmate's notes as my notes will not be available. You cannot excel in this course if you do not come to class.1- **Attendance**: students are strongly encouraged to attend class on a regular basis, as participation is important to understanding of the material. This is student opportunity to ask questions. Students are responsible for obtaining any information during the class which provided.2- **Lateness**: Lateness to class is disruptive3- **Electronic** devices: All cell phones are to be turned off at the beginning of class and put away during the entire class.4-**Talking**: During class please refrain from side conversations. These can be disruptive to your fellow students and your professor |
| **Required Learning Materials**  | - Printouts of weekly lectures taught at the college campus - Reviewing of internet  |
| **Forms of teaching** | The material will be presented at a level suitable for undergraduates by lecturing, discussion, video, power points and seminar |
| **Evaluation** | ‌ **Task** | **Weight (Marks)** | **Due Week** | **Relevant Learning Outcome** |
| Paper Review  |  |  |  |
| Assignments | Homework | 5% |  | Encourages students to search for more detailed knowledge relevant to the topics taught at campus. |
| Class Activity | 2% |  |  |
|  |  |  |  |
| Seminar | 10% |  | Enhances the preparation and presenting skills of the students |
| report | 10% |  | To make students engage more with their favorite topics |
| Project |  |  |  |
| Quiz | 8% |  | To encourage students, study every week. |
| Midterm Exam | 25% |  | To evaluate students and their achievements at the middle of the term. |
| Final Exam | 40% |  | Final evaluation and assessment.  |
| Total | 100% |  |  |
| **Specific learning outcome:** | **By the end of this course learners will:**By the end of the course students will acquire good understanding of biostatistics in addition to basic data analysis; learn how to conduct statistical analysis using SPSS; gain skills of describing and interpreting statistical data; apply statistical inferences to address research questions; evaluate the role of statistical methods in solving real life problems. As a result, the student will possess a basic understanding of descriptive and inferential statistics, and their practical use in making decisions in medical. |
| **Course References‌:** | 1. Books
* Collier, J. (2009), Using SPSS Syntax: A Beginner's Guide, London, SAGE.
* Davis, C. (2002), Statistical Methods for the Analysis of repeated measurements, USA, Springer- Verlang.
* Field, A. (2000), Discovering statistics Using SPSS for Windows: Advance technique for the beginners, London, SAGE publication Ltd.
* Hogg, R. and Craig, A. (1970), Introduction to Mathematical Statistics, Third Edition, London, The Macmillan Company. ▪
1. Useful references:
* Landau, S. And Exeritt, B. (2004), A Handbook of Statistical Analyses Using SPSS, London, Chapman & Hall/CRC Press LLC. (Textbook)
1. Magazines and review (internet):
* RAO, C. (2009), Linear Statistical Inference and its Application, London, John Wiley & Sons. SPSS Tutorials http://www.spsstools.net/spss.htm.
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| **Course topics (Theory)** | **Week** | **Learning Outcome** |
| ***Theoretical part***Introduction to Biostatistics* Definition of Biostatistics,
* Statistics Keywords and Language
* General Purposes of statistics
* Class Exercise
* Types of Variables
* Class Exercise

**Practical Part: (SPSS)**Introduction to SPSS Program* How to open IBM SPSS Program
* How to input data in SPSS program
 | **1st** |  |
| ***Theoretical part***Frequency Distribution* What is Frequency Distribution?
* Steps of Frequency Distribution
* Proportion and Percentage
* Frequency Histogram and Polygon
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Test of frequency
 | **2nd**  |  |
| ***Theoretical part**** The cumulative frequency distribution
* Grouped Frequency Distributions
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Create a Grouped Frequency
* Histogram and Polygon
 | **3rd**  |  |
| ***Theoretical part**** Class midpoint
* Class Boundaries
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Create a Grouped Frequency
* Class midpoint
* Class Boundaries
* Histogram and Polygon
 | **4th**  |  |
| ***Theoretical part***MEASURES OF CENTRAL TENDENCY* The Mode
* The Median
* The Mean
* Class Exercise

***Practical Part: (SPSS)**** Descriptive Statistics
* Conducting the Three Measures of Central Tendency.
 | **5th**  |  |
| ***Theoretical part***Shapes of Distributions* The normal distribution
* A skewed distribution
* Positively Skewed Distribution
* Negatively Skewed Distribution
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Frequency Charts
* Normal Curve
 | **6th**  |  |
| ***Theoretical part***VARIABILITY* Variation
* Range
* Standard Deviation
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Dispersion test
 | **7th**  |  |
| ***Theoretical part**** Inferential Statistics
* Level of Significance and P-Values
* T-Tests (Independent Samples T-Test)
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Data analysis: Independent Samples T-Test
 | **8th - 9th**  |  |
| ***Theoretical part**** Inferential Statistics
* Paired Samples T-Test
* One-sample t-test
* Class Exercise

***Practical Part: (SPSS)**** Input the Collected Data
* Data analysis: Independent Samples T-Test
* Correlation
* AVOVA
 | **10th – 11th**  |  |
| **Theoretical part**POPULATIONS AND SAMPLES* Target Populations and Accessible Populations
* SAMPLING TECHNIQUES
* TYPES OF PROBABILITY SAMPLING METHODS
* TYPES OF NON-PROBABILITY SAMPLING METHODS

***Practical Part: (SPSS)**** Applying all the stepes from inputing data to the data analysis using all the learned tests
 | **12th – 13th**  |  |
| **Questions Example Design (theoretical and practical exam):**All of the activities provided in the workload section are considered when awarding you a grade for this course. In order to pass this course, you will need to earn a 60% or higher on the final exam. Your score on the exam will be calculated as soon as you complete it. If you do not pass the exam on your first try, you may take it again in the second trial.* Type of the exam (composition and multiple choice)
* Exam's duration (for example one hour)
* The number of the questions: at least four questions. The marks distributed evenly throughout.

The answer should contain preface, main contents and conclusion.ExampleQ1\ for the below data, find that there is effect of socio-economic class on physical development of children or not. Where Physical development was classified on a scale of 1 (none) to 5 (fully developed) and the socio-economic class of their parents was assessed on a scale of 1 to 4. (15 Marks)

|  |  |
| --- | --- |
|  | Physical development |
| 1 | 2 | 3 | 4 | 5 |
| Socio-economic Class of parents | 1 | 2 | 14 | 28 | 40 | 18 |
| 2 | 1 | 21 | 25 | 25 | 9 |
| 3 | 1 | 12 | 12 | 12 | 2 |
| 4 | 6 | 17 | 34 | 33 | 6 |

***Practical Part Test*** Q1/ Fill in blanks in the below table form output of SPSS program (using Demo.Sav file) (5marks)

|  |  |
| --- | --- |
| **Group Statistics** |  |
| Income category in thousands | N | Mean | Std. Deviation | Std. Error Mean |  |
| Age in years | Under $25 |   |   |   |   |  |
| $50 - $74 |   |   |   |   |  |
|  |  |  |  |  |  |  |
| **Independent Samples Test** |
|   | Levene's Test for Equality of Variances | t-test for Equality of Means |
| F | Sig. | t | df | Sig. (2-tailed) |
|  |
| Age in years | Equal variances assumed |   |   |   |   |   |  |
| Equal variances not assumed |   |   |   |   |   |  |

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|  **Extra notes:** |
| **External Evaluator** |