Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine

Course Specification of Medical biostatistics
Course No. (05.02.318)

Prepared by:	Reviewed by:	Head of the Department:	Vice Dean for Quality affairs	Dean of College:
Dr Gamil Taher Abdul Mughni	Dr\Ghamdan Ahmed Altahish		Dr\Gamil Taher Abdul Mughni	Associate Prof. Dr. Ebtesam Al-Zabedi

I. Course Identification and General Information:						
1	**Course Title:**	Medical Biostatistics				
2	**Course Code & Number:**	05.02.318				
3	**Credit Hours:**	**Theory Hours**			**Credit Hours**	
		Lecture	**Exercise**	**Practical**		
		2	0	0	2	
4	**Study Level/ Semester at which this Course is offered:**	4st Level / First Semester				
5	**Pre –Requisite (if any):**	none				
6	**Co –Requisite (if any):**	English				
7	**Program (s) in which the Course is Offered:**	Bachelor in laboratory medicine				
8	**Language of Teaching the Course:**	English				
9	**Study System:**	semester				
10	**Mode of Delivery:**	Regular				
11	**Location of Teaching the Course:**	University Campus				
12	**Prepared by:**	Dr Gamil Taher Abdul Mughni				
13	**Date of Approval:**	2023				

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II. Course Description:

This course provides an introduction to the principles and methods of biostatistics. Topics covered include descriptive statistics, probability, sampling, hypothesis testing, regression, and analysis of variance. Students will learn how to use statistical software to analyze data and interpret results.

III. Alignment Course Intended Learning Outcomes with program outcomes

III. Course Intended Learning Outcomes (CILOs)		Referenced PILOs
A. Knowledge and Understanding: ***Upon successful completion of the course, students will be able to:***		
a1	Understand the basic concepts of biostatistics	**A1**
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	Use statistical software to analyze data	**B1**
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	Interpret the results of statistical analyses	**C1**
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***		
d1	Communicate statistical findings effectively	**D1**

IV. Alignment Course Intended Learning Outcomes with Teaching Strategies and Assessment methods:

(A) Alignment Course Intended Learning Outcomes of Knowledge and Understanding to Teaching Strategies and Assessment Strategies:

	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
a1	Understand the basic concepts of biostatistics	Lectures	Exam

(B) Alignment Course Intended Learning Outcomes of Intellectual Skills to Teaching Strategies and Assessment Strategies:

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	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Use statistical software to analyze data	Lectures	Exam
C Alignment Course Intended Learning Outcomes of Professional and Practical Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
c1	Interpret the results of statistical analyses	Lectures	Exam
(D) Alignment Course Intended Learning Outcomes of Transferable Skills to Teaching Strategies and Assessment Strategies:			
	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
d1	Communicate statistical findings effectively	Seminars	seminars

V. Course Content:

A – Theoretical Aspect:

NO.	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	Introduction	Definition of Biostatistics, Some Basic Concepts (Data and Sources of data, Variables, Population Samples and Methods of data collection	**1**	**2**	a1,b1,c1
2	-Descriptive Statistics - Measures of central tendency • Describe how different data are related to each other • Correlation	1- Measures of central tendency (Mode, Median, Mean) 2- Measures of dispersion (range, variance, standard deviation) 3- Graphical displays (histograms, box plots, scatter plots) Frequency Distributions, Bias, Precision, and Accuracy	**1**	**2**	a1,b1

	coefficient				
3	Design of Experiments and Collection of Data	Sampling By Questionnaire, Sampling In the Chemical Laboratory Sampling In Biological and Clinical Experiments	**1**	**2**	a1,b1,c1
4	Design and Conduct of Clinical Trials	Allocation of Patients in randomized design, crossover design	**1**	**2**	a1,b1,c1,d1
5	Probability and Probability Distributions	- Probability concepts and rules - Probability distributions include: The Normal Distribution The Binomial Distribution The Poisson distribution, etc.) Computing Probabilities from The Normal Distribution, Normal Approximation - Sampling distributions	**1**	**2**	a1, c1,d1
6	Sampling methods	Introduction Common terms used in sampling Sampling methods Errors in Sampling	**1**	**2**	a1,b1,d1
7	Estimation	-Introduction -Point estimation. -Sampling distribution of means -Interval estimation (large samples) -Sample size estimation	**1**	**2**	a1,b1,c1
	Med exam		**1**	**2**	a1,b1,c1,d1
6	Statistical Inference Estimation And Statistical Inference and Data Transformations	- Estimation of population parameters - Hypothesis testing (null and alternative hypotheses, p-values, type I and type II errors) - Confidence intervals	**1**	**2**	a1 ,d1
7	Data Analysis and Interpretation	- Data cleaning and management - Parametric and non-parametric tests (t-tests, ANOVA, chi-square, etc.) - Regression analysis (linear, logistic, etc.) - Survival analysis	**1**	**2**	a1,b1,c1

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8	Study Design	- Types of studies (experimental, observational, cross-sectional, longitudinal) - Sampling techniques (random sampling, stratified sampling, cluster sampling) - Bias and confounding	**1**	**2**	a1,b1, d1
9	Hypothesis Testing	-Introduction -The Null and Alternative Hypotheses Level of significance -Tests of significance on means and proportions (large samples) - One tailed tests -Comparing the means of small samples Confidence interval or P-value? -Test of significance using the Chi-square and Fisher's exact tests	**1**	**2**	a1,b1
10	Correlation and Regression	Introduction Correlation analysis Regression analysis	**1**	**2**	a1,b1,c1,d1
11	Statistical software	spss	**1**	**2**	c1,d1
12	FINAL THEORTICAL		**1**	**2**	a1,b1,c1,d1
	TOTAL		**12**	**24**	

V. Teaching Strategies of the Course:	
1-	**Lectures**
2-	**Self-leaning**
3-	**seminars**

VI. Assessment Methods of the Course:

No	Assignment
1	Written Exams (Short Essays) and Quizzes
2	Multiple Choice Questions (MCQ)

VII. Assignments:

No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes
1	**Midterm Exam**	8	30	30%	a1, b1,c1,d1
2	**Final Exam**	16	70	70%	a1, b1,c1,d1
	Total	100		100%	

IX. Learning Resources:

1- Required Textbook(s)

1-	Kutner, M. H., Nachtsheim, C. J., Neter, J., and Wasserman, W. (2014). Applied Linear Regression Models (5th ed.). New York, NY: McGraw-Hill.
2-	Freedman, D. A., Pisani, R., Purves, R., & Adhikari, A. (2018). Statistics (5th ed.). New York, NY: W. H. Freeman.

2- Essential References.

1-	Moore, D. S., and McCabe, G. P. (2016). Introduction to the Practice of Statistics (9th ed.). New York, NY: W.H. Freeman.

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2-	Rosner, B. (2015). Fundamentals of Biostatistics (8th ed.). New York, NY: Springer.

3- Electronic Materials and Web Sites *etc*.

1-	**Biostatistics & Epidemiology** https://guides.library.umass.edu/bioepi/web
2-	https://seer.cancer.gov/data-software/
3-	https://www.bettycjung.net/Statpgms.htm

XI. *Course Policies:*

1	**Class Attendance:** Class Attendance is mandatory. A student is considered absent and shall be banned from taking the final exam if his/her absence exceeds 25% of total classes.
2	**Tardiness:** -If the student dose not attend for more than 6 times, the student will be obligated to withdrew from the course
3	**Exam Attendance/Punctuality:** No student shall be allowed to the exam hall after 30 minutes of the start time, and shall not leave the hall before half of the exam time has passed.
4	**Assignments & Projects:** Assignments and projects must be submitted on time. Students who delay their assignments or projects shall lose the mark allocated for the same.
5	**Cheating:** Cheating is an act of fraud that results in the cancelation of the student's exam or assignment. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
6	**Forgery and Impersonation:** Forgery/Impersonation is an act of fraud that results in the cancelation of the student's exam, assignment or project. If it takes place in a final exam, the penalties stipulated for in the Uniform Students' Bylaw (2007) shall apply.
7	**Other policies:** The University official regulations in force will be strictly observed and students shall comply with all rules and regulations of the examination set by the Department, Faculty and University Administration

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