

Republic of Yemen
Ministry of Higher Education & Scientific Research
**21 SEPTEMBER UNIVERSITY of MEDICALS &
APPLIED SCIENCES**



Faculty of Laboratory medicine..

Department of Hematology
Course Specification of Research Methodology
Course No. (03.13. 319)
2022/2023

Prepared by:	Reviewed by:	Heamatolgy Department Charge D'affairs	Vice Dean for Quality affairs	Dean of College:
- Dr. Ebtasam Mahdi Al-Zabedi	. Dr Ghamdan Al- Tahish	Dr\Gamil Taher Abdul Mughni	Dr\Gamil Taher Abdul Mughni	- Associate Prof. Dr. Ebtasam Al-Zabedi

I. Course Identification and General Information:				
1	Course Title:	Research Methodology		
2	Course Code & Number:	03.13. 319		
3	Credit Hours:	Theory Hours		
		Lecture	Exercise	Practical
		2	0	2
	Credit Hours	3		
4	Study Level/ Semester at which this Course is offered:	1 st Level / 1 st Semester		
5	Pre –Requisite (if any):	None		
6	Co –Requisite (if any):	None		
7	Program (s) in which the Course is Offered:	Master Degree Medical Diagnostic Hematology		
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:			
13	Date of Approval:	2022-2023		

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II. Course Description:

This course will introduce students to the principles of research methodology and biostatistics. Students will learn how to design and conduct research studies, collect and analyze data, and interpret the results of statistical analyses. The course is designed for students who are interested in pursuing a career in research, control, or teaching related to health sciences

III. Alignment Course Intended Learning Outcomes with program outcomes

III. Course Intended Learning Outcomes (CILOs)		Referenced PILOs
A. Knowledge and Understanding: <i>Upon successful completion of the course, students will be able to:</i>		
a1	Understand specialized research methods and data collection	a1
B. Intellectual Skills: <i>Upon successful completion of the course, students will be able to:</i>		
b1	Design advanced research project autonomously synthesizing the various ethical, statistical, and reporting methods	b1
C. Professional and Practical Skills: <i>Upon successful completion of the course, students will be able to:</i>		
c1	Demonstrate mastery in advanced research methods when write clear and concise research reports.	c1
c2	Applied advanced ethical issues in research	c3
D. Transferable Skills: <i>Upon successful completion of the course, students will be able to:</i>		
d1	Communicate effectively about Research Methods and Scientific Writing to a variety of audiences	D1

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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 specialized research methods and data collection	Lecture	Exam

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

	Course Intended Learning Outcomes	Teaching strategies	Assessment Strategies
b1	Design advanced research project autonomously synthesizing the various ethical, statistical, and reporting methods	Lecture	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	Demonstrate mastery in advanced research methods when write clear and concise research reports.	Lecture Discussion Presentation	Exam Discussion Presentation
C2	Applied advanced ethical issues in research	Lecture Discussion Presentation	Exam Discussion Presentation

(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 effectively about Research Methods and Scientific Writing to a variety of audiences	Lecture Discussion Presentation	Exam Discussion Presentation

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Course Content:					
A – Theoretical Aspect:					
Order	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes
1	Introduction to Biostatistics and Research Methodology	<ul style="list-style-type: none"> •Definitions •Meaning of Descriptive and Inferential Statistics •Population and Sample •Types of Variable •Measurement Scales •Measurement Errors 	2	4	a1,b1,c1,c3,d1
2	Presentation of Data	<ul style="list-style-type: none"> •Presenting data by graphs and tables •Box Plots •Sources of Data 	2	4	a1,b1,c1,c3,d1
3	Measure of Central Tendency • Definition of Average and its types	<ul style="list-style-type: none"> • Definition of Average and its types • A.M, G.M, H.M, Median and Mode • Quantiles • Properties of Mean • Relative merits and Demerits of These averages 	2	4	a1,b1,c1,c3,d1
4	Measure of Dispersion	<ul style="list-style-type: none"> • Absolute and Relative Dispersion • Range • Quartile Deviation • Mean Deviation • Variance • Standard Deviation • Skewness • Kurtosis • Practicing Exercise 	1	2	a1,b1,c1,c3,d1
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		(Testing & Numerical)			
5	Probability	Random Experiments Sample Space and Events Different Definitions of Probability	1	2	a1,b1,c1,c3,d1
6	Simple Regression and Correlation	<ul style="list-style-type: none"> Regression and Correlation definitions and interpretation Scatter Diagram Least Square Method Coefficient of Determination	3	6	a1,b1,c1,c3,d1
7	Sampling	<ul style="list-style-type: none"> Definition Sampling Design and Sampling Frame Probability and Non-Probability Sampling Sampling and Non-Sampling Errors Sampling Distribution of Mean and Variance Difference of Means 	1	2	a1,b1,c1,c3,d1
8	Hypothesis Testing	<ul style="list-style-type: none"> Definition Null and Alternative Hypothesis Critical region Type I and Type II error Level of Significance P-Value and power of test Acceptance and Rejection Regions Chi-square, Z-Test and T-Test	3	6	a1,b1,c1,c3,d1
9	Analysis of Variance and Experimental Design	Analysis of Variance of One-Way and Two- Way Complete Randomized Randomized Complete Block	1	2	a1,b1,c1,c3,d1

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		Latin Square Design			
		Factorial Experiments			
10	Screening	<ul style="list-style-type: none"> •Reliability and Validity of a Screening Test •Sensitivity and Specificity •Predictive values 	1	2	a1,b1,c1,c3,d1
11	Final exam		1	2	a1,b1,c1,c3,d1
Number of Weeks /and Units Per Semester			16	32	

V. Teaching Strategies of the Course:

1-	Lectures
2-	Practical session
3-	Self leaning
4-	Group discussion
	Case study analysis

VI. Assessment Methods of the Course:

No	Assignment
1	Written Exams (Essays) and Quizzes
2	Structured Oral Exams
4	Objective Structured Practical Exams (OSPE)
5	Student presentation
6	Case study analysis

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VII. Assignments:					
No.	Assignments	Week Due	Mark	Proportion of Final Assessment	Aligned CILOs (symbols)
2	Activity	Throughout the semester	10	10%	a1,a2,b1,c3,d1
3	Practical Report	Throughout the semester	10	10 %	a1,a2,b1,c3,d1
4	Practical exam	12	20	20%	a1,a2,b1,c3,d1
5	Final Exam	14	60	60%	a1,a2,b1,c3,d1
Total					

Learning Resources:
<ul style="list-style-type: none"> Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).
1- Required Textbook(s) (maximum two).
1-Robert R. Pagano., 2009 (9 th Edition). Study guide understanding Statistics in the Behavioral Sciences. Cengage Learning.
2-Chap T. Le., 2003 (2 nd Edition). Introductory Biostatistics. John Wiley & Sons, Inc.
2- Essential References.
1-Indrayan A. and Malhotra R. K., 2012 (3 rd Edition). Medical Biostatistics. CRC Press.
2-Qiu, P., 2013 (2 nd Edition). Introduction to statistical process control. Chapman and Hall/CRC.
3-Waqar H Kazmi and Farida Habib Khan., 2014 (1 st Edition) Basics in Epidemiology and

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Biostatistics (Jaypee Publishers)

Wep

4- <https://pubmed.ncbi.nlm.nih.gov/>

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 withdraw 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.

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5	<p>Cheating: Cheating is an act of fraud that results in the cancellation 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.</p>
6	<p>Forgery and Impersonation: Forgery/Impersonation is an act of fraud that results in the cancellation 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.</p>
7	<p>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</p>

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