Republic of Yemen

Ministry of Higher Education & Scientific Research

21 SEPTEMBER UNIVERSITY of MEDICALS & APPLIEED

SCIENCES

Faculty of Laboratory medicine

Course Specification of Epidemiology
Course No. (01.02.307)

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

I. Course Identification and General Information:						
1	**Course Title:**	Epidemiology				
2	**Course Code & Number:**	01.02.307				
3	**Credit Hours:**	**Theory Hours**				
		Lecture	**Exercise**	Practical	**Credit Hours**	
		2	0	0	2	
4	**Study Level/ Semester at which this Course is offered:**	3th Level / 2nd Semester				
5	**Pre –Requisite (if any):**	NONE				
6	**Co –Requisite (if any):**	BIOSTATICS				
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\Ghamdan Ahmed Altahish				
13	**Date of Approval:**	2023				

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	A. II. Course Description:
	This course introduce the students to the epidemiological methods and their applications in order to equip them with the knowledge and skills necessary for epidemiological research, principles of screening, investigation of an outbreak and public health in the global context

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	**Demonstrate** the various epidemiological studies.	**A1**
a2	**Define** the epidemiology.	**A3**
B. Intellectual Skills: ***Upon successful completion of the course, students will be able to:***		
b1	**Interpret and evaluate** the different types of study designs and their strengths and weaknesses.	**B3**
C. Professional and Practical Skills: ***Upon successful completion of the course, students will be able to:***		
c1	Plan to control contagious diseases by prevention, vaccination and education.	**C1**
D. Transferable Skills: ***Upon successful completion of the course, students will be able to:***		
d1	Relate various epidemiological studies	**D1**

C. 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	**Demonstrate** the various epidemiological studies.	Lectures	exam
a2	**Define** the epidemiology.	Lectures	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	**Interpret and evaluate** the different types of study designs and their strengths and weaknesses.	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	**Plan** to control contagious diseases by prevention, vaccination and education.	Lectures Fieldwork Computer and web	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	Relate various epidemiological studies	Lectures	seminars

IV. Course Content:

A – Theoretical Aspect:

NO.	Units/Topics List	Sub Topics List	Number of Weeks	contact hours	Learning Outcomes (CILOs)
1	**Introduction**:	- Definition and scope of epidemiology. The History of Epidemiology The development of epidemiology The contributions of major epidemiologists	1	2	a1 ,b1 ,c1
2	Measures of Disease Occurrence and Association	-introduction -measures of incidence -measures of prevalence -Uses of Incidence and Prevalence -Relationship between Incidence and Prevalence	1	2	a1,a2 ,b1
3	Classification of study designs	a.Descriptive vs analytical b. Observational vs experimental c. Retrospective vs prospective Study Designs Experimental studies Observational studies Case-control studies Cohort studies	1	2	a1,a2
4	Descriptive Studies	a. Case reports, case series, cross sectional, & correlational/ecological studies	1	2	a1, c1
5	Cohort Studies	a. Meaning of word cohort b. Definition of exposure/non exposure c. Selection of study groups & control groups: internal &	1	2	a1 ,b1

		external d. Follow up & ascertainment of outcome/ disease status e. Analysis: Relative risk (RR), Attributable risk (AR), Attributable risk percent (ARP) f. Establishment of chance/significance of effect measures g. Impact of RR & AR on common/rare diseases h. Interpretation/application of effect measures i. Advantages & disadvantages			
6	Case Control Studies (CCS)	a. Selection of study groups b. Sources of study group members c. Selection of control group: traditional, incidence density& case cohort d. Sources of control groups e. Advantage & disadvantages of selection from each source f. Use of multiple controls g. Matching of cases & controls/confounding h. Other methods of control for confounding i. Ascertainment of exposure j. Analysis: Odds ratio (OR) k. Bias – recall/interviewer l. Effect measure: Odds Ratio (OR) M Establishment of chance/significance of effect measure n. Interpretation of effect measure o. Advantages& disadvantages of CCS	1	2	a1, a2

7	Cross Sectional Analytical Studies	a. Selection of study groups b. Effect measures: OR & prevalence rate ratio c. Uses & Limitations	1	2	a1,a2 ,b1 ,c1
8	Med exam		1	2	a1, ,b1 c1
9	Experimental Studies	a. Difference between experimental & quasi experimental studies b. Community trials/drug trials c. Cluster randomized trials d. Before & after designs e. Parallel group designs f. Cross over designs g. Phase I, II, III, and VI trials h. Selection of experimental group i. Selection of control group/s j. Application of simple randomization: advantages & disadvantages k. Concealment of allocation l. Single / double blinding m. Intention to treat analysis n. Relevant effect measures: RR, risk reduction, relative risk reduction & number needed to treat & harm	1	2	a1, a2,c1
10	Types of Error	a. Random error – definition , precision, measures of overcoming random errors b. Systematic errors – definition & introduction to bias c. Bias: Types Selection – volunteering, non-participation, detection, incidence –prevalence, Berkson's bias, loss to follow up	1	2	a1,a2 ,b1

		Information –Differential & non-differential (basics) Recall and interviewer bias Confounding: definition, Measures to overcome (basics): Selection stage – matching, restriction & randomization Analysis stage- stratified & multivariate analysis			
11	Screening & Diagnostic	a. Criteria to decide the need for screening b. Measures of test performance: sensitivity, specificity& predictive values positive & negative c.. Application to population level e. Bias related to evaluation of screening programmes f. ROC curves g. Diagnostic tests: Introduction h. Difference between screening & diagnostic tests	1	2	a1, ,b1 ,c1
12	Quality of Data	a. Reliability –definition b. Types: inter observer reliability, internal consistence, test re -test reliability & parallel forms [basics] c. Analysis: Qualitative data: Percent agreement , Kappa coefficient & interpretation Quantitative data: , Altman – Bland plot & interpretation	1	2	a1, ,b1 ,c1

		d. **Validity** – definition Types – face, content, consensual, criterion & construct [basics]			
13	Effect Measures	a. Overview: RR, OR, AR, ARP, SMR, PMR, Difference of means b. Establishment of chance /significance of effect measures c. Impact of RR & AR on common/rare diseases d. Interpretation /application of effect measures, advantages & disadvantages	1	2	a1, ,b1 ,c1
14	Causality Lecture	a. Relationship between association and causation b. Causal criteria	1	2	a1,a2
15	Evidence Based Medicine (EBM)	Definition of EBM Basics of a systematic review and meta-analysis Advantages of systematic review and meta-analysis Steps involved in designing a systematic review Interpretation of a forest plot	1	2	a1, a2,b1 ,c1
16	Final Theoretical Exam		1	2	
	Number of Weeks /and Units Per Semester		16	32	

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V. Teaching Strategies of the Course:	
1-	Lectures
2-	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,a2,b1
2	**Final Exam**	16	70	70%	a1,a2,b1
	Total	100		100%	

IX. Learning Resources:

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· *Written in the following order: (Author - Year of publication – Title – Edition – Place of publication – Publisher).*

1- Required Textbook(s) (maximum two).

1-	Hennekens, C.H., Buring, J.E. (2013). Epidemiology In Medicine, Brown and Company, Boston.
2-	Marit L. Bovbjerg (2019). Foundations of Epidemiology, Publisher: Oregon State University

2- Essential References.

1-	*Epidemiology and Biostatistics: :* ***Bryan Kestenbaum***
2-	

3- Electronic Materials and Web Sites *etc.*

1-	World Health Organization (WHO). http://www.who.int/topics/public_health_surveillance/en/. Accessed September 10, 2018.
2-	Centers for Disease Control and Prevention (CDC). https://www.cdc.gov/index.htm
3-	https://www.cdc.gov/ophss/csels/dsepd/ss1978/lesson1/section11.html. Accessed September 10, 2018.
4-	https://open.oregonstate.education/epidemiology/chapter/introduction-to-2x2-tables-epidemiologic-study-design-and-measures-of-association/

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.

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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