#### **Faculty Of Veterinary Medicine**

**Veterinary Medicine Program** 









### **Course Specification of Biostatistics**

I	I. Course Identification and General Information:							
1	Course Title:	Biostatistics						
2	Course Number & Code:	FR217						
		С.Н				Total		
3	Credit hours:	Theoretical	Practical	Training	Seminar	Total		
		2	1	0	0	3		
4	Study level/ semester at which this course is offered:	Second Year - Second Semester						
5	Pre -requisite (if any):		F	R116				
6	Co –requisite (if any):		N	None				
7	Program (s) in which the course is offered:	Bachelor of Veterinary Medicine						
8	Language of teaching the course:	English Language						
9	Location of teaching the course:	Faculty of Veterinary Medicine Building						
10	Prepared by:	D	r. Abdu-Alra	oof Al-Shav	wkany			
11	Date of approval:							

### **II. Course description:**

This course is designed to acquire veterinary medicine student with basic principle of statistics and Emphasis on application in of veterinary medicine problems. The course focuses on descriptive and inferential statistics as applied to veterinary medicine practice. The course starts with descriptive measures and probability concepts. Conditional probability and bayes theory are given due emphasis to compute validity indicators for clinical and laboratory test, i.e sensitivity, specificity and predictive values for single and multiple tests. The students are trained to draw statistical inference by two main methods these are: estimation and hypothesis testing. Z, T, Chi-square and F tests are discussed with relevant clinical examples. Students are trained to use computer software as Excel and SPSS in solving assigned exercises.

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II	III. Intended learning outcomes (ILOs) of the course:				
<b>(A)</b>	<b>Knowledge and Understanding:</b>				
Ali	gnment of Course Intended Learning Outcomes (CILOs) to Pr Unde	_		Os) in: Knowledge and	
Program Intended Learning Outcomes (Sub- PILOs) in:  Knowledge and Understanding  Course Intended Learning Outcomes (CILOs)  Knowledge and Understanding				nderstanding	
After	completing this program, students will be able to:	After	r completing this course, studen	ts will be able to:	
A1-	Demonstrate a sound knowledge and understanding of concepts and principles of general culture, basic science, and that support veterinary medicine.	a1- Identify biostatistics and type of a variable and the difference between nominal, ordinal, discrete, continuous, ungrouped and grouped			
A3-	Identifies various causes of animal diseases, animal epidemics and how they can be diagnosed; including common and lifethreatening diseases of animals, poultry and fish.	a2-	Define sample, population randomization	s, random sample and	
	Teaching And Assessment Method	ds Fo	or Achieving Learning	Outcomes:	
	Alignment of Learning Outcomes of Knowledge and				
Cou	rse Intended Learning Outcomes (CILOs) in	Tea	aching strategies/methods	Methods of assessment	
	Knowledge and Understanding	_	to be used		
a1- a2-	Identify biostatistics and type of a variable and the difference between nominal, ordinal, discrete, continuous, ungrouped and grouped Define sample, populations, random sample and randomization	- shows and multimedia aids brainstorm discussion Self-learning by preparing essay and presentations (computer and faculty library)		-Written exam -Practical exam -Oral exam - Quizzes - Report assignments - Discussion	
		-Pra	ctical training		

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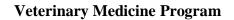


<b>(B)</b>	(B) Intellectual Skills:					
	ment of Course Intended Learning Outcomes (CILOs) to Pr	ogram	Intended Learning Outcomes (PI	LOs) in: Intellectual skills		
Pro	ogram Intended Learning Outcomes (Sub-	C	ourse Intended Learning			
A 64	PILOs) in Intellectual skills	A 64	Intellectual			
After	completing this program, students will be able to:	After	completing this course, stude	nts will be able to:		
B1-	Competently practices analytical and critical thinking skills in studying and assessing health problems and reading the results of animal medical examinations that is related to sciences.	b1- Calculate the mean, median, mode, range, variance, standard deviation and coefficient of variation.				
B2-	Predicts an appropriate medical diagnosis for the most common disease states through analysis of clinical story data and the results of medical examinations of a sick animal.	<b>b2-</b> Compute Pearson's correlation coefficient r, Spearman's correlation coefficient rs				
	Teaching And Assessment Metho					
	ment of Learning Outcomes of Intellectual Skill	ī				
	urse Intended Learning Outcomes (CILOs) in Intellectual Skills.	Tea	nching strategies/methods to be used	Methods of assessment		
After	completing this course, students will be able to:		tures using board, data	-Written exam		
b1-	Calculate the mean, median, mode, range, variance, standard deviation and coefficient of variation.	shows and multimedia aids brainstorm discussion.		-Practical exam -Oral exam - Quizzes		
b2-	Compute Pearson's correlation coefficient r, Spearman's correlation coefficient rs	essa; (con libra	f-learning by preparing y and presentations aputer and faculty ary) ctical training	<ul><li>Report assignments</li><li>Discussion</li></ul>		

### (C) Professional and Practical Skills:

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Align	Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: Professional and Practical Skills					
	gram Intended Learning Outcomes (Sub- LOs) in Professional and Practical Skills		urse Intended Learning ( Professional and Pr			
After completing this program, students will be able to:			completing this course, stud	ents will be able to:		
C1-	Accurately records a comprehensive pathological story of a sick animal including information on healthy behavior and the necessary checks	c1-	Construct the frequency cumulative, percentage a from raw data.			
C4-	Treat animal patients safely and effectively considering the evaluation of the results, the appropriate modification of the treatment plan and the accurate description of the appropriate medications.	c2-	Use SPSS program in da data	ta entry and analysis of		
	Teaching And Assessment Met			U		
	nment of Learning Outcomes of Professional and Pract ourse Intended Learning Outcomes (CILOs) in Professional and Practical Skills		aching strategies/methods to be used	Methods of assessment		
After	completing this course, students will be able to:		actical training olving Examples and	-Written exam -Practical exam		
c1-	Construct the frequency table relative, cumulative, percentage and grouped frequency from raw data.	Some Exercise -O		-Oral exam - Quizzes - Report assignments		
c2-	Use SPSS program in data entry and analysis of data			- Discussion		

(D) General / Transferable Skills:				
Alignment of Course Intended Learning Outcomes (CILOs) to Program Intended Learning Outcomes (PILOs) in: General and Transferable skills				
Program Intended Learning Outcomes (PILOs) in General / Transferable skills  Course Intended Learning Outcomes (CILOs) in General / Transferable skills				
After completing this program, students will be able to:  After completing this course, students will be able to:				

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D1-	Communicates effectively with other fellow professions and animal owners and expresses his ideas clearly and objectively.  Teaching And Assessment Met	, , , , , , , , , , , , , , , , , , ,		
	lignment of Learning Outcomes of General and Tree Intended Learning Outcomes (CILOs) in		able skills to Teaching and a ning strategies/methods to	Assessment Methods:  Methods of
204	General and Transferable Skills		be used	assessment
After	completing this course, students will be able to:		learning by preparing and presentations	<ul><li>Achievement file</li><li>Evaluating student</li></ul>
d1-	Make survey about one veterinary medicine problem to collected data from population	essay and presentations (computer and faculty library) - Cooperative learning and working groups - Scientific visits - discussions - Assignments		presentations Practical exam - Report assignments - Discussion - Note performance

IV.	IV. Course Content:							
1 –	1 – Course Topics/Items:							
	a – Theoretical Aspect							
Order	Topic List / Units	CILOs (symbols)	Sub-topic List	Number of weeks	Contact hours			
1	Introduction	a1, a2, b1, b2, c1, c2	Statistical and biostatistics Concepts Type of Data and Information Type of variable, difference between nominal and ordinal, difference between discrete and continuous	1	2			

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2	Describing data by table	a1, a2, b1, b2, c1, c2	Relative, cumulative and percentage frequency for ungrouped data tables. Relative, cumulative and percentage frequency for grouped data tables	1	2
3	Describing data by chart	a1, a2, b1, b2, c1, c2	Charting ungrouped data by pie, simple clustered, stacked bar, step charts, time series charts. Charting grouped data histogram, curve and ogive	2	4
4	Describing data by numeric value	a1, a2, b1, b2, c1, c2	Measure of location and dispersion. Mod, median, mean, rang, variance, standard deviation, coefficient of variation	2	4
5	Sampling	a1, a2, b1, b2, c1, c2	Methods of Collecting Data random sample and randomization Sampling and Non sampling Errors Survey conditions	1	2
6	Correlation	a1, a2, b1, b2, c1, c2	linear relationship between two variables (rxy), Type of correlation coefficient, R2	1	2
7	Regression	a1, a2, b1, b2, c1, c2	Simple Linear Regression Model Equation Regression Using it in Diagnostics	1	2
8	Introduction to Hypothesis Testing	a1, a2, b1, b2, c1, c2	Test hypothesis, Null and alternative hypothesis, Significance level and P value. Testing the Population Mean When the Population Standard Deviation Is Known	2	4

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Number of Weeks /and Units Per Semester					28
10	SPSS Program	a1, a2, b1, b2, c1, c2	Use SPSS program for data entry of survey data, describing and analysis of data.	2	4
9	Introduction to Hypothesis Testing	a1, a2, b1, b2, c1, c2	Inference a Population Mean When the Standard Deviation Is Unknown (T and Z test).  Inference about the Difference between Two Means: Independent Samples Inference about the Difference between Two Means: Matched Pairs Experiment Chi-square test. F test Analysis of Variance.	1	2

	b- Training Aspect:				
Order	Training Tasks	CILOs (symbols)	Number of weeks	Contact hours	
1	Data entry in SPSS program	a1, a2, b1, b2, c1, c2, d1	3	6	
2	Descriptive statistic	a1, a2, b1, b2, c1, c2, d1	3	6	
3	Correlation and Regression	a1, a2, b1, b2, c1, c2, d1	3	6	
4	Test Hypothesis (Z, T and X2 testes)	a1, a2, b1, b2, c1, c2, d1	3	6	
5	Test Hypothesis (F testes)	a1, a2, b1, b2, c1, c2, d1	2	4	
	Number of Weeks /and Units Per Semester				

### V. Teaching strategies of the course:

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Dean of the Faculty Ass. Prof. Dr. Abdu Alraoof Al-Shawkany Academic Development Center & Quality Assurance Ass. Prof. Dr. Huda Al-Emad

Rector of Sana'a University Prof. Dr. Al-Qassim Mohammed Abbas

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- Lectures using board, data shows and multimedia aids.
- Self-learning by preparing essay and presentations (computer and faculty library)
- Brainstorm
- Discussion
- Cooperative learning
- Practical training
- Tutorial classes (small group teaching)

#### **3-Assessment Methods:**

- -Written exam
- -Practical exam
- -Oral exam
- -Quizzes
- Report assignments
- Discussion

Grading Scale:

Grades are awarded on a scale from A to F, where A is the best grade(90-100) and F is a fail (<50).

$\mathbf{V}$	VI. Schedule of Assessment Tasks for Students During the Semester:						
No.	Assessment Method	Week Due	Mark	Proportion of Final Assessment	Aligned Course Learning Outcomes (CILOs symbols)		
1	Participation quizzes and assignments	2-14	10	10%	a1, a2, b1, b2, c1, c2, d1		
2	Mid-Term Exam	8	10	10%	a1, a2, b1, b2, c1, c2, d1		
3	Mid-Term Practical Exam	8	10	10%	a1, a2, b1, b2, c1, c2, d1		

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5	Oral exam	16	5	5%	a1, a2, b1, b2, c1, c2, d1
6	Final Exam	16	55	55%	a1, a2, b1, b2, c1, c2, d1
	Total		100	100%	

VII. Students' Support:	
Office Hours/week	Other Procedures (if any)
Saturday-Wednesday from 8:00 a.m2 p.m.	Student can contact me via email

VIII. Learning Resource (MLA style or APA style)S:
1- Required Textbook(s) ( maximum two )
1- Daniel, Wayne and Cross. C. L. 2013. Biostatistics: A foundation for analysis in the health sciences, student solutions manual. 10 <sup>th</sup> edition, John Wiley, Canada.
2- David Bowers. 2008. Medical Statistics from Scratch An Introduction for Health Professionals, JohnWiley and Sons, England.
2- Recommended Readings and Reference Materials
3- Essential References
Kanishka Bhattacharya.2004. Introduction to Statistics for Medical Students, University of Oxford.
4- Electronic Materials and Web Sites etc.
www.MikeMiddleton.com
5- Other Learning Material:

<b>X.</b>	Course Policies:
1	Class Attendance:
	MANDATORY TO ATTEND ALL COURSE LECTURES
2	Tardiness:
	Not allowed at all. Students must be in class or in the practical session 10 minutes prior to the

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	beginning of lectures or practical session
3	Exam Attendance/Punctuality: Attendance is mandatory; absence is accepted with valid excuse
4	Assignments & Projects: All assignments and projects are to be submitted on their due date. Any assignment turned in after the due date will not be accepted without valid and reasonable excuse
5	Cheating: Not tolerated and may lead to <b>EXPELLING</b> the student from the program
6	Plagiarism: Not tolerated AT ALL and may lead to EXPELLING the student from the program
7	<ol> <li>Other policies:         <ol> <li>All devices must be on silent or at least on vibration during lectures/labs</li> <li>Before any exam (written, oral) we must check student's identity (student's card, ID, passport). Without any of these documents, the student will not be allowed in the exam room.</li> <li>Any of type/ form of cheating is not allowed no matter what.</li> </ol> </li> <li>Maintain silence during lectures/exam and disturbance is not allowed. For any questions students should raise their hand and wait for permission to talk.</li> </ol>

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### **Course Plan of Biostatistics**

X Information about Faculty Member Responsible for the Course:							
Name of Faculty Member	Dr. Abdu-Alraoof Al- Shawkany			Office	Hours		
Location & Telephone No.	Yemen-Sana`a, Thamr university, 771135616	SAT	SUN	MON	TUE	WED	THU
E-mail	abdualraufe@yahoo.com abdualraufe@gmail.com	8am 2pm	8am 2pm	8am 2pm	8am 2pm	8am 2pm	

KI. (	(I. Course Identification and General Information:					
1-	Course Title: Biostatistics					
2-	Course Number & Code:	FR217				
			C.I	Н		Total
3-	Credit hours:	Th.	Seminar	Pr.	F. Tr.	Total
		2	0	1	0	3
4-	Study level/year at which this course is offered:	Second Year - Second Semester				
5-	Pre -requisite (if any):	FR116				
6-	Co –requisite (if any):	None				
7-	Program (s) in which the course is offered	Bachelor Veterinary Medicine				
8-	Language of teaching the course:	English language				
9-	System of Study:	Regular / Semesters				
10-	Mode of delivery:	Lectures and Practical				
11-	Location of teaching the course:	Aching the course: Faculty of Veterinary Medicine Building				

### II. Course Description:

This course is designed to acquire veterinary medicine student with basic principle of statistics and

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Emphasis on application in of veterinary medicine problems. The course focuses on descriptive and inferential statistics as applied to veterinary medicine practice. The course starts with descriptive measures and probability concepts. Conditional probability and bayes theory are given due emphasis to compute validity indicators for clinical and laboratory test, i.e sensitivity, specificity and predictive values for single and multiple tests. The students are trained to draw statistical inference by two main methods these are: estimation and hypothesis testing. Z, T, Chi-square and F tests are discussed with relevant clinical examples. Students are trained to use computer software as Excel and SPSS in solving assigned exercises.

### II. Intended learning outcomes (ILOs) of the course:

#### After completing this course, students will be able to:

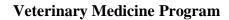
- a1- Identify biostatistics and type of a variable and the difference between nominal, ordinal, discrete, continuous, ungrouped and grouped
- a2- Define sample, populations, random sample and randomization
- b1- Calculate the mean, median, mode, range, variance, standard deviation and coefficient of variation.
- b2- Compute Pearson's correlation coefficient r, Spearman's correlation coefficient rs
- c1- Construct the frequency table relative, cumulative, percentage and grouped frequency from raw data.
- c2- Use SPSS program in data entry and analysis of data
- d1- Make survey about one medical problem to collected data from population.

V. Course Content:				
A – Theoretical Aspect:				
Order	Topics List	Week Due	Contact Hours	
1	Introduction	1	2	

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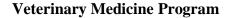
2	Describing data by table	2	2
3	Describing data by chart	3,4	4
4	Describing data by numeric value	5,6	4
5	Sampling	7	2
6	Mid-Term Exam	8	2
7	Correlation	9	2
8	Regression	10	2
9	Introduction to Hypothesis Testing	11,12	4
10	Introduction to Hypothesis Testing	13	2
11	SPSS Program	14,15	4
12	Final exam	16	2
	Number of Weeks /and Units Per Semester	16	32

	b- Training Aspect:		
Order	Training Tasks	Week Due	Contact hours
1	Data entry in SPSS program	1,2,3	6
2	Descriptive statistic	4,5,6	6
3	Correlation and Regression	7,8,9	6
4	Mid-Term Exam	10	2
5	Test Hypothesis (Z, T and X2 testes)	11,12,13	6
6	Test Hypothesis (F testes)	14,15	6
7	Final exam	16	2
	Number of Weeks /and Units Per Semester	16	32

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### V. Teaching strategies of the course:

- Lectures using board, data shows and multimedia aids.
- Self-learning by preparing essay and presentations (computer and faculty library)
- Brainstorm
- Discussion
- Cooperative learning
- Practical training
- Tutorial classes (small group teaching)

#### /I. Assessment Methods:

- -Written exam
- -Practical exam
- -Oral exam
- -Quizzes
- Report assignments
- Discussion

Grading Scale:

Grades are awarded on a scale from A to F, where A is the best grade (90-100) and F is a fail (<50)

No.	Type of Assessment Tasks	Week Due	Mark	Proportion of Final Assessment
1	Participation quizzes and assignments	2-14	10	10%
2	Mid-Term Exam	8	10	10%
3	Mid-Term Practical Exam	8	10	10%
4	Final Practical Exam	15	10	10%
5	Oral exam	16	5	5%
6	Final Exam	16	55	55%
	Total		100	100%

### II. Learning Resources:

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1- R	equired Textbook(s) ( maximum two ).
	1. Daniel, Wayne and Cross. C. L. 2013. Biostatistics: A foundation for analysis in the health
	sciences, student solutions manual. 10 <sup>th</sup> edition, John Wiley, Canada.
	2. David Bowers. 2008. Medical Statistics from Scratch An Introduction for Health
	Professionals, JohnWiley and Sons, England.
2-	Essential References.
	Kanishka Bhattacharya. 2004. Introduction to Statistics for Medical Students, University of Oxford.
3-	Electronic Materials and Web Sites etc.
	• www.MikeMiddleton.com
	3. Course Policies:
1	Class Attendance:
	MANDATORY TO ATTEND ALL COURSE LECTURES
2	Tardy:
	Not allowed at all. Students must be in class 10 minutes prior to the beginning of lectures
3	Exam Attendance/Punctuality:
	Attendance is mandatory; absence is accepted with valid excuse
4	Assignments & Projects:
	All assignments and projects are to be submitted on their due date. Any assignment turned in after
	the due date will not be accepted without valid and reasonable excuse.
5	Cheating:
	Not tolerated and may lead to <b>EXPELLING</b> the student from the program
6	Plagiarism:
	Not tolerated AT ALL and may lead to EXPELLING the student from the program
7	Other policies:
	1. All devices must be on silent or at least on vibration during lectures/labs.
	2. Before any exam (written, practical, oral) student's identity will be checked (student's card, ID,
	passport). Without any of these documents, the student will not be allowed in the exam room.
	3. Any of type/ form of cheating is not allowed no matter what.
	4. Maintain silence during lectures and disturbance is not allowed.

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