هيئة تقويم التعليم والتدريب
Education & Training Evaluation Commission
اعتماد
NCAAA
2024
TP-153

Course Specification
(Bachelor)

Course Title:	**Biostatistics**
Course Code:	**STA 2101**
Program:	**Bachelor of Science in Medecine**
Department:	**Mathematics and Statistics**
College:	Science
Institution:	**Imam Mohammad Ibn Saud Islamic University**
Version:	**2024 – V1**
Last Revision Date:	**2 October 2024**

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours: (.....)					
2 (2 Lectures, 0 Lab, 2 Tutorial)					
2. Course type					
A.	☐University	☐College	☒ Program	☐Track	☐Others
B.	☒ Required		☐Elective		
3. Level/year at which this course is offered: (Level 1 / Year 1)					
4. Course General Description:					
This course describes the most important ideas, theoretical results, and examples of descriptive statistics, probability, random variables, probability distributions, point and interval estimations, and test hypothesis. The course includes the essential fundamentals of these topics. The emphasis is on calculations, and some applications related to biostatistics are mentioned.					
5. Pre-requirements for this course (if any):					
None					
6. Co-requisites for this course (if any):					
None					
7. Course Main Objective(s):					
• Describe discrete data graphically and compute measures of centrality and dispersion. • Compute probabilities by modeling sample spaces and applying rules of permutations and combinations, additive and multiplicative laws and conditional probability. • Construct the probability distribution of a random variable, based on a real-world situation, and use it to compute expectation and variance. • Compute probabilities based on practical situations using the discrete and continuous distributions. • Estimate some population parameters using point and interval estimation, especially for the mean and proportion. • Apply testing hypotheses for the mean and proportion.					

2. Teaching mode (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	***Traditional classroom***	60	100%
2	***E-learning***	0	0
3	Hybrid • Traditional classroom • E-learning	0	0
4	***Distance learning***	0	0%

3. Contact Hours (based on the academic semester)

No	Activity	Contact Hours
1.	**Lectures**	**30**
2.	**Laboratory/Studio**	**0**
3.	**Field**	**0**
4.	**Tutorial**	**30**
5.	**Others (specify)**	**0**
Total		**60**

B. Course Learning Outcomes (CLOs), Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	**To state the various measures of central tendency and dispersion.**	**K1, K2**	2 lecture hours per week Classroom discussions	**Direct:** Regular Exams, Lab Assignments,
1.2	**To outline basic probability concepts and techniques of counting for the calculation of probabilities.**	**K1, K2**	1 tutorial hour per week 1 lab hour per week	**Direct:** Regular Exams, Lab Assignments,
1.3	**To define and reproduce some special probability distributions.**	**K1, K2**	Lecturing, Interactive learning.	**Direct:** Assignments, Practical exam
2.0	**Skills**			
2.1	**To summarize data using tables and charts.**	**S1, S2, S5**	**Use of statistical software, Lecturing, Interactive learning.**	**Direct:** Lab Exam, Assignments, Practical exam
2.2	**To compute descriptive summary measures for a population and the coefficient of correlation.**	**S2, S3, S5**	**Use of statistical software, Lecturing, Interactive learning.**	**Direct:** Lab Exam, Assignments, Practical exam
2.3	**To compute probabilities from the binomial, Poisson, Normal and T distributions.**	**S3, S4**	**Lecturing, Interactive learning.**	**Direct:** Assignments, Practical exam
2.4	**To calculate probability mass functions, the expected value and variance for discrete random variables**	**S1, S2, S3**	**Lecturing, Interactive learning.**	**Direct:** Assignments, Practical exam
2.5	**To estimate the mean and proportions for one sample and two samples**	**S1, S2, S3**	**Lecturing, Interactive learning.**	**Direct:** Assignments, Practical exam
3.0	**Values, autonomy, and responsibility**			
3.1	**To defend the formulated conclusions.**	**V1, V2**	**Interactive learning, Group interaction, Problem solving.**	**Direct:** Participation

Code	Course Learning Outcomes	Code of PLOs aligned with the program	Teaching Strategies	Assessment Methods
3.2	**To operate meaningfully and productively with others.**	**V1, V3**	**Teamwork and class discussions.**	**Direct:** Homework and Mini projects

C. Course Content

No	List of Topics	Contact Hours
1.	**The Role of statistics in Medicine:** Introduction to statistics, Types of data and graphical representation, Frequency tables.	**8**
2.	**Descriptive Statistics:** Measures of Central Tendency (Mean, Median, Mode), Measures of location (Percentiles and quartiles), Measures of Dispersion (Range, Interquartial rqnge, Standard Deviation, Coefficient of Variation).	**6**
3.	**Probability:** Basic Probability, Conditional probability, Concept of Independence, Bayes Theorem Sensitivity, Specificity and Predictive Value Positive or Negative.	**8**
4.	**Random Variables and Discrete Distributions:** Random Variables and Cumulative Probability, Some Discrete Probability Distributions: Binomial and Poisson, Their Mean and Variance (Excluding the use of binomial and Poisson tables).	**8**
5.	**Continuous Probability Distributions:** Normal Distribution, Standard Normal Distribution and t-distributions.	**8**
6.	**Sampling Distribution:** Sampling Distributions of Sample Mean and Sample Proportion for one and two samples (Excluding sampling without replacement).	**8**
7.	**Statistical Inference:** Point and interval Estimation, Type of Errors and Concept of P-Value, Confidence Interval for Population Mean and Population Proportion (Excluding variances not equal page).	**8**
8.	**Hypothesis Testing:** Testing Hypothesis about one Sample Mean and Proportion one and two samples (Excluding variances not equal).	**6**
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	**HomeWorks, Quizzes, Mini projects**	**During the term**	**10%**
2.	**First Midterm**	**Week 5-6**	**25%**
3.	**Second Midterm (Lab exam)**	**Week 10-11**	**25%**
4.	**Final Exam**	**Week 16-17**	**40%**

*Assessment Activities (i.e., Written test, oral test, oral presentation, group project, essay, etc.).

E. Learning Resources and Facilities

1. References and Learning Resources

Essential References	**BIOSTATISTICS A Foundation for Analysis in the Health Sciences by WAYNE W. DANIEL and CHAD L. CROSS (Main Reference).**
Supportive References	1. ***Introduction to Probability and Statistics;*** 14th Edition, W. Mendenhall, R. J. Beaver, Barbara M. Beaver, Duxbury Press, 2013. 2. ***Elementary Statistics***, 14th edition; Mario F. Triola, Pearson, 2021.
Electronic Materials	None
Other Learning Materials	None

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ **Each class room should be equipped with a whiteboard and a projector.** ▪ **Laboratories should be equipped with computers and an internet connection.**
Technology equipment (projector, smart board, software)	**The rooms should be equipped with data show and Smart Board.** **All computers should be equipped with the following software:** ▪ **Microsoft Excel** ▪ **IBM SPSS** ▪ **R-Project** ▪ **MATLAB**
Other equipment (depending on the nature of the specialty)	**None**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Student and teaching staff**	**Surveys and Questionnaires**
Effectiveness of Students assessment	**Course Coordinator**	**Peer Reviews**
Quality of learning resources	**Students and teaching staff**	**Classroom Observations**
The extent to which CLOs have been achieved	**Student Representatives**	**Student Performance Evaluations (exams, projects)** **CLOs Excel sheet.**
Other	**None**	

Assessors (Students, Faculty, Program Leaders, Peer Reviewers, Others (specify)

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL
REFERENCE NO.	
DATE	