Course Specification
— (Bachelor)

Course Title: Statistical Packages

Course Code: STA 1240

Program: Bachelor of Science in Actuarial and Financial Mathematics

Department: Mathematics and Statistics

College: Science

Institution: Imam Mohammad Ibn Saud Islamic University

Version: 2024 – V1

Last Revision Date: None

Table of Contents

A. General information about the course:

1. Course Identification

1. Credit hours:
3 (2 Lectures, 2 Lab, 0 Tutorial)

2. Course type				
A.	☐University	☐College	☒ Program	☐Track	☐Others
B.	☒ Required			☐Elective	

3. Level/year at which this course is offered: Level 4 / Year 2

4. Course general Description:

Using the statistical tools and the program codes in the statistical software packages, including Excel, Minitab, SPSS and R. Topics include creating and managing data files, graphical presentation – summary statistics, hypotheses testing.

5. Pre-requirements for this course (if any):

STA 1105

6. Co-requisites for this course (if any):

None

7. Course Main Objective(s):

Students after completing the course will have:
- To familiarize students with basic Statistical packages such as EXCEL, MINITAB, SPSS and R.
- To illustrate the importance of Statistical packages and how to use it to calculate several statistical computations.
- To study the properties of each package, show the statistical tools and the differences between them.
- To illustrate how to use each package for analyzing different data sets and explain how can interpret the results and write the statistical reports

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	30
3.	Field	0
4.	Tutorial	0
5.	Others (specify)	0
Total		60

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

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
1.0	**Knowledge and understanding**			
1.1	Describe discrete and continuous distributions and compute sums and partial sums of numerical series and integrals.	K2	Lecture strategy, Laboratory	Direct: Regular Exams, Assignments, Lab exam
1.2	Define random sample from different statistical distributions	K3	Lectures, problem-solving, Classroom discussions	Direct: Regular Exams, Assignments, Lab exam
2.0	**Skills**			
2.1	Use statistical packages in data analysis and mathematical manipulations of matrices.	S1, S3	Lecturing, Interactive learning.	Direct: Projects, Exams, Homework
2.2	Compute some statistical and mathematical metrics such as the average, mean and average variance of means of several groups of data.	S1, S3	Lecturing, Interactive learning.	Direct: Projects, Exams, Homework
3.0	**Values, autonomy, and responsibility**			
3.1	Perform tasks with responsibility	V1	Interactive learning, Group interaction, Problem solving.	Direct: Lab exam, Assignments

Code	Course Learning Outcomes	Code of CLOs aligned with program	Teaching Strategies	Assessment Methods
3.2	Construct collaborations with others.	V1	Group interaction, Problem solving.	Direct: Assignments and Mini projects

C. Course Content

No	List of Topics	Contact Hours
1.	Provide general concepts on the course and an overview of statistical programs.	5
2.	Descriptive statistics and Statistical tests using excel. Sampling and random number generation in Excel.	5
3.	Introduction to Minitab. Descriptive statistics using Minitab.	5
4.	Statistical tests using Minitab. Correlation and regression using Minitab.	5
5.	Introduction to SPSS.	5
6.	Descriptive statistics using SPSS. Statistical tests using SPSS.	6
7.	Introduction to R. Statistical and mathematical functions in R.	6
8.	Descriptive statistics using R.	6
9.	Statistical distributions in R.	6
10.	Statistical tests using R.	6
11.	Applications, Programming and simulation.	5
Total		**60**

D. Students Assessment Activities

No	Assessment Activities *	Assessment timing (in week no)	Percentage of Total Assessment Score
1.	Homework, 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	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	1. **MINITAB Manual, Michael Evans;** W.H. Freeman and Company, 2009. 2. **Excel Data Analysis: Modeling and Simulation;** Hector Guerrero, Springer, 2019. 3. **IBM SPSS Statistics 23 Step by Step: SPSS Survival Manual: A Simple Guide and Reference;** 14th Edition, Darren George, Paul Mallery, Routledge, Taylor & Francis, 2016. 4. **A Beginner's Guide to R; Alain F. Zuur, Elena N. Ieno, Erik H. W. G. Meesters,** Springer Science Business Media, 2009.
Supportive References	**None**
Electronic Materials	**Websites on the internet that are relevant to the topics of the course.**
Other Learning Materials	**Multi-media is associated with the text book and the relevant websites.**

2. Required Facilities and equipment

Items	Resources
facilities (Classrooms, laboratories, exhibition rooms, simulation rooms, etc.)	▪ **Each classroom 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 365** ▪ **IBM SPSS** ▪ **R-Project** ▪ **MATLAB** ▪ **Minitab**
Other equipment (depending on the nature of the specialty)	**None**

F. Assessment of Course Quality

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of teaching	**Students**	**During the semester and at the end of the course, each student will complete two evaluation forms.**

Assessment Areas/Issues	Assessor	Assessment Methods
Effectiveness of Students assessment	**Instructor**	**At the end of each semester, the course instructor should complete the course report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.**
Quality of learning resources	**Students**	**During the semester and at the end of the course, each student will complete two evaluation forms.**
The extent to which CLOs have been achieved	**Instructor**	**At the end of each semester, the course instructor should complete the course report, including a summary of student questionnaire responses appraising progress and identifying changes that need to be made if necessary.**
Other	**None**	

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

Assessment Methods (Direct, Indirect)

G. Specification Approval

COUNCIL /COMMITTEE	**MATHEMATICS AND STATISTICS DEPARTMENT COUNCIL**
REFERENCE NO.	**8/1446**
DATE	**05/04/1446 (08/10/2024)**