اعتماد
NCAAA

T4

2020

Course Specifications

Course Title:	Regression Analysis
Course Code:	STAT 332
Program:	Statistics
Department:	Statistics and Operations Research
College:	Science
Institution:	King Saud University

Table of Contents

A. Course Identification

1. Credit hours:	3				

2. Course type

a. University ☐ College ☐ Department **X** Others ☐

b. Required **X** Elective ☐

3. Level/year at which this course is offered: **Level 5 / Year 3**

4. Pre-requisites for this course (if any)**:** STAT 328 and MATH 244

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

6. Mode of Instruction (mark all that apply)

No	Mode of Instruction	Contact Hours	Percentage
1	**Traditional classroom**	3	100%
2	**Blended**		
3	**E-learning**		
4	**Distance learning**		
5	**Other**		

7. Contact Hours (based on academic semester)

No	Activity	Contact Hours
1	**Lecture**	30
2	**Laboratory/Studio**	30
3	**Tutorial**	30
4	**Study, Library and Projects**	60
	Total	150

B. Course Objectives and Learning Outcomes

1. Course Description

The course contains a various topics and techniques of Data Analysis using statistical software. It starts briefly with study of the simple linear regression model using both classical and matrices approaches, and then moves widely to study the multiple linear regression model. It covers important topics that are commonly used in real-life applications, specifically calculation of the estimated parameters of the regression model, Confidence Intervals, Hypotheses Testing, Sum of Squares (Regression, Error and Total), Coefficient of Determination and Correlation. Model diagnostics and transformations. Model validity and model selection. Applications to some real data sets using the statistical packages.

2. Course Main Objective

Students after completing the course will have:

- Ability to apply the suitable regression models to some real data sets.
- Ability to use and integrate statistical techniques in any scientific inquiry

- Understanding how to select the best methods to analysis data by using the statistical packages.
- Ability to give right interpretations of statistical results
- The skills to prepare and write statistical reports.
- Gain some advantages :self-confidence, Responsibility, Respect the other ideas, discussion, discussion in groups and Leadership

3. Course Learning Outcomes

	CLOs	Aligned PLOs
1	**Knowledge and Understanding**	
1.1	Constructing the regression model.	K1
1.2	Understand the statistical inferences of the related regression models.	K2
2	**Skills :**	
2.1	Choosing the appropriate regression model to some real life problems.	S1
2.2	Use the statistical software for the calculations of the regression models.	S3
3	**Values:**	
3.1	Recognize the important of the statistical thinking and training to solve some real life problem using the regression models.	V1
3.2	Developing the communication skills through writing comments, summarizing findings and participatory interpersonal sharing of knowledge.	V3

C. Course Content

No	List of Topics	Contact Hours
1	Definition of the simple linear regression model with some applications	2
2	Estimation of the unknown parameters of the simple linear regression model	2
3	Properties of the least square estimates.	2
4	Residual analysis and properties.	2
5	Statistical inference, including; confidence intervals and Hypotheses Testing of the simple linear regression model.	4
6	The efficiency of the simple linear regression model by using ANOVA	2
7	Predication and residual analysis of the simple linear regression model	2
8	Diagnostics and Remedial Measures of the simple regression model	2
9	Studying the simple linear regression model using matrices.	2
10	The Multiple linear regression models	2
11	Estimation of the unknown parameters of the multiple linear regression model.	2
12	The statistical inference and properties of estimators for the multiple linear regression model.	2
13	Model validity and selection	2
14	Applications to some real data sets using the statistical packages.	2
	Total	30

D. Teaching and Assessment

1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
1.0	**Knowledge and Understanding**		
1.1	Constructing the regression model.	Lecture	Written exams Assignments Projects Quizzes
1.2	Understand the statistical inferences of the related regression models.	Lecture	Written exams Assignments Projects Quizzes
…			
2.0	**Skills**		
2.1	Choosing the appropriate regression model to some real life problems.	Lecture Laboratory	Written exams Assignments Projects Quizzes
2.2	Use the statistical software for the calculations of the regression models.	Lecture Laboratory	Written exams Assignments Projects Quizzes
3.0	**Values**		
3.1	Recognize the important of the statistical thinking and training to solve some real life problem using the regression models.	Laboratory	Discussions Assignments Projects Quizzes
3.2	Developing the communication skills through writing comments, summarizing findings and participatory interpersonal sharing of knowledge.	Laboratory	Discussions Assignments Projects Quizzes
…			

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First Exam	8	24%
2	Assignments, quizzes and Project	3-14	12%
3	Second Exam	12	24%
4	Final Exam	16	40%
8			

*Assessment task (i.e., written test, oral test, oral presentation, group project, essay, etc.)

E. Student Academic Counseling and Support

Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice :

For at least five hours a week, faculty and teaching staff are available to provide student consultations and academic advice.

F. Learning Resources and Facilities

1.Learning Resources

Required Textbooks	Applied Linear Regression Models, Fifth Edition by Kutner, Nachtsheim and Neter
Essential References Materials	• Draper, N.R. and Smith, H. (1998). Applied regression Analysis, John Wiley and Sons, New York. • Chatterjee, S and Hadi A. S., (2012) Regression Analysis by Example, 5-th Edition, John Wiley & Sons, Inc. • Weisberg S. (2005), Applied Linear Regression, 3rd Edition, John Wiley & Sons, Inc.
Electronic Materials	• Websites on the internet that are relevant to the topics of the course.
Other Learning Materials	• Multi-media associated with the text book and the relevant websites • KSU library.

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Computer Lab with at least 40 systems
Technology Resources (AV, data show, Smart Board, software, etc.)	R, SPSS, SAS and MINITAB Data show Smart Board
Other Resources (Specify, e.g. if specific laboratory equipment is required, list requirements or attach a list)	

G. Course Quality Evaluation

Evaluation Areas/Issues	Evaluators	Evaluation Methods
Effectiveness of teaching	Students	Indirect (Survey)
Quality of learning resources	Students	Indirect (Survey)
Achievement of course learning outcomes	Faculty	Direct (Written exams + Assignments + Project)

Evaluation areas (e.g., Effectiveness of teaching and assessment, Extent of achievement of course learning outcomes, Quality of learning resources, etc.)
Evaluators (Students, Faculty, Program Leaders, Peer Reviewer, Others (specify)
Assessment Methods (Direct, Indirect)

H. Specification Approval Data

Council / Committee	Course coordinator: Prof. Khalaf Sultan
Reference No.	
Date	Feb. 22, 2022

Course Specifications