



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	3
6. Mode of Instruction (mark all that apply)	3
B. Course Objectives and Learning Outcomes	4
1. Course Description	4
2. Course Main Objective.....	4
3. Course Learning Outcomes	4
C. Course Content	5
D. Teaching and Assessment	5
1. Alignment of Course Learning Outcomes with Teaching Strategies and Assessment Methods	5
2. Assessment Tasks for Students	6
E. Student Academic Counseling and Support	6
F. Learning Resources and Facilities	6
1. Learning Resources	6
2. Facilities Required.....	7
G. Course Quality Evaluation	7
H. Specification Approval Data	7

A. Course Identification

1. Credit hours: 3(2+0+2)
2. Course type
a. University <input type="checkbox"/> College <input type="checkbox"/> Department <input checked="" type="checkbox"/> Others <input type="checkbox"/>
b. Required <input checked="" type="checkbox"/> Elective <input type="checkbox"/>
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	Correspondence		
5	Other		

7. Actual Learning Hours (based on academic semester)

No	Activity	Learning Hours
Contact Hours		
1	Lecture	30
2	Laboratory/Studio	30
3	Tutorial	
4	Others (specify)	
	Total	60
Other Learning Hours*		
1	Study	40
2	Assignments	
3	Library	20
4	Projects/Research Essays/Theses	40
5	Others(specify)	
	Total	100

*The length of time that a learner takes to complete learning activities that lead to achievement of course learning outcomes, such as study time, homework assignments, projects, preparing presentations, library times

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, 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.

2. Course Main Objective

Students after completing the course will have:

- Ability to use and integrate statistical techniques in any scientific inquiry
- Understanding how to select the best methods to analysis data by using software R
- 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:	
1.1	Understand and describe the relationships between many variables.	K1
1.2	Understand and difference between the response and independent variables.	K1
1.3	Developing statistical inferences of the regression model.	K2
1.4	Understand, study and analysis problems that are arising in the different real life situations	K3
2	Skills :	
2.1	Data management.	S4
2.2	Ability to construct the regression model	S2
2.3	To have understanding about the use of different techniques in the data analysis and their underlying assumptions under different situations.	S2
2.4	Ability of using software R for the calculations in the regression models, such as R.	S4
3	Competence:	
3.1	Work independently and as part of team during the class and discussion outside the class.	C2
3.2	Participatory discussions in the class in order to develop their own views on some problems of interest and exchange of views.	C2
3.3	Developing the communication skills through writing comments, summarizing findings and participatory interpersonal sharing of knowledge	C2
3.4	Use the computer for analyzing and processing the real data.	C3

C. Course Content

No	List of Topics	Contact Hours
1	Introduction and some basic concepts of probability and statistics	4
2	Definition of the Simple linear regression model with some applications	4
3	Estimation of the unknown parameters of the simple linear regression model	4
4	Properties of the least square method	4
5	Confidence estimation of the least square estimated of the coefficient of simple linear regression model.	4
6	Hypotheses Testing of the simple linear regression model	4
7	The efficiency of the simple linear regression model by using ANOVA	4
8	Predication and residual analysis of the simple linear regression model	4
9	Multiple linear regression model	4
10	Estimation of the unknown parameters of the multiple linear regression model.	4
11	Hypothesis testing of the multiple linear regression model	4
12	Prediction and residual analysis of the multiple linear regression model	4
13	Linear regression based on the categorical with some application	4
14	Applications and Revision	8
Total		60

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		
1.1	Foundation about theory of regression models.	Lecture	Written exams
1.2	The methods of estimation, properties of the estimators, and applications.	Lecture	Written exams
1.3	To acquire knowledge about the recent developments in the regression models and their applications.	Lecture	Written exams
2.0	Skills		
2.1	The methods of estimation, the applications to various distributions, the properties of the estimators, etc	Lecture+ Laboratory/Studio	Project Written Exams
2.2	Theoretical developments during the recent past and their applications to real life problems.	Lecture+ Laboratory/Studio	Written Exams
2.3	To have understanding about the use of different techniques and their underlying assumptions under different situations.	Lecture+ Laboratory/Studio	Written Exams
3.0	Competence		
3.1	Work independently and as part of team during the class and discussion outside the	Laboratory/Studio	Project

Code	Course Learning Outcomes	Teaching Strategies	Assessment Methods
3.2	class. Participatory discussions in the class in order to develop their own views on some problems of interest and exchange of views.	Laboratory/Studio	Discussion in the classroom
3.3	Developing the communication skills through writing comments, summarizing findings and participatory interpersonal sharing of knowledge	Laboratory/Studio	Discussion in the classroom Project
3.4	Use the computer for analyzing and processing the real data.	Laboratory/Studio	Project + Exams

2. Assessment Tasks for Students

#	Assessment task*	Week Due	Percentage of Total Assessment Score
1	First Exam	9	25%
2	Project	11	10%
3	Second Exam	13	25%
4	Final Exam	16	40%

*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	<p>نماذج إحصائية خطية تطبيقية (الجزء الأول)، المؤلف: نيتير وآخرون ترجمة: د. انيس كنجو – د. عبد الحميد الزيد – د. الحسيني عبد البر</p> <p>Applied Linear Regression Models, Fifth Edition by Kutner, Nachtsheim and Neter</p>
Essential References Materials	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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
---------------------------------	---

2. Facilities Required

Item	Resources
Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.)	Computer room containing at least 40 systems
Technology Resources (AV, data show, Smart Board, software, etc.)	R Statistical software 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 + 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 instructor \ Dr. Walid Emam
Reference No.	
Date	6/5/2021