



## **ATTACHMENT 5.**

# **T6. COURSE SPECIFICATIONS (CS) Stat 332 Regression Analysis**



هيئة تقويم التعليم  
Education Evaluation Commission

## Course Specifications

Institution: King Saud University	Date: 10/2/2018
College/Department : <b>College of Science / Department of Statistics and O. R.</b>	

### A. Course Identification and General Information

1. Course title and code: <b>Statistical Packages (stat 332)</b>			
2. Credit hours: 3(2+0+2)			
3. Program(s) in which the course is offered. <b>Statistics and Operations Research</b>			
4. Name of faculty member responsible for the course: Prof. Khalaf S. Sultan			
5. Level/year at which this course is offered: <b>5th Level (Statistics) , 7th (Operation Research) and 5th (Actuarial and Financial Mathematics)</b>			
6. Pre-requisites for this course (if any): <b>Stat 328 + Math 244</b>			
7. Co-requisites for this course (if any): <b>None</b>			
8. Location if not on main campus:			
9. Mode of Instruction (mark all that apply):			
a. traditional classroom	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="66.7%"/>
b. blended (traditional and online)	<input type="checkbox"/>	What percentage?	<input type="text"/>
c. e-learning	<input checked="" type="checkbox"/>	What percentage?	<input type="text" value="33.3%"/>
d. correspondence	<input type="checkbox"/>	What percentage?	<input type="text"/>
f. other	<input type="checkbox"/>	What percentage?	<input type="text"/>
Comments: Teaching 2 hours' classroom and 2 hours' computer lab.			

## B. Objectives

1. What is the main purpose for this course?

- Understanding the linear and nonlinear regression models in bulk of the data to explanation of some of different phenomenon.
- Understanding the methods for testing the validity of the regression model.
- Understanding how to select the best methods to analysis data and using statistical packages as R.
- Give the right interpretations of the results of the regression model.
- Preparing and writing the statistical reports.

2. Briefly describe any plans for developing and improving the course that are being implemented. (e.g. increased use of IT or web based reference material, changes in content as a result of new research in the field)

- Electronic materials and computer based programs have been utilized to support the lecture course material.
- Posting course materials on the course Webpage.
- Introduction for using the statistical packages in the regression analysis such as R.
- Updating the books and the webpage of the course periodically.

## C. Course Description (Note: General description in the form used in Bulletin or handbook)

Course Description:

Simple linear regression model - Multiple linear regression - Analysis of residuals and predictions – inference about the parameters - Stepwise regression - Some nonlinear regression models and data transformations - Student will use statistical computer packages such as R.

1. Topics to be Covered

List of Topics	No. of Weeks	Contact hours
Introduction and some basic concepts of probability and statistics	1	4
Definition of the Simple linear regression model with some applications	1	4
Estimation of the unknown parameters of the simple linear regression model	1	4
The least square and the maximum likelihood method for estimating the parameters	1	4
Confidence estimation of the least square estimated of the coefficient of simple linear regression model.	1	4
Hypotheses Testing of the simple linear regression model	1	4

The efficiency of the simple linear regression model by using ANOVA	1	4
Predication and residual analysis of the simple linear regression model	1	4
Some nonlinear regression models and data transformations	1	4
Multiple linear regression model	1	4
Estimation of the unknown parameters of the multiple linear regression model.	1	4
Hypothesis testing of the multiple linear regression model	1	4
Prediction and residual analysis of the multiple linear regression model	1	4
Stepwise regression	1	4
Linear regression based on the categorical with some application	1	4

2. Course components (total contact hours and credits per semester):

		Lecture	Tutorial	Laboratory/ Studio	Practical	Other:	Total
Contact Hours	Planed	30			30		60
	Actual	30			30		60
Credit	Planed	45			15		60
	Actual	45			15		60

3. Additional private study/learning hours expected for students per week.

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4. Course Learning Outcomes in NQF Domains of Learning and Alignment with Assessment Methods and Teaching Strategy

**On the table below are the five NQF Learning Domains, numbered in the left column.**

**First**, insert the suitable and measurable course learning outcomes required in the appropriate learning domains (see suggestions below the table). **Second**, insert supporting teaching strategies that fit and align with the assessment methods and intended learning outcomes. **Third**, insert appropriate assessment methods that accurately measure and evaluate the learning outcome. Each course learning outcomes, assessment method, and teaching strategy ought to reasonably fit and flow together as an integrated learning and teaching process. (Courses are not required to include learning outcomes from each domain.)

Code #	NQF Learning Domains And Course Learning Outcomes	Course Teaching Strategies	Course Assessment Methods
1.0	<b>Knowledge</b>		
1.1	Understand and describe the relationships between many variables	In class lecturing where the previous	class short quizzes

		knowledge is linked to the current and future topics	
1.2	Understand and difference between the response and independent variables	Homework assignments	Major and final exams
1.3	Developing statistical inferences of the regression model	Tutorial discussions	Major and final exams
1.4	Understand, study and analysis problems that are arising in the different real life situations	Homework assignments	Major and final exams
1.5	Ability of using the statistical packages used for the calculations in the regression models, such as R.	Homework assignments	Major and final exams
<b>2.0</b>	<b>Cognitive Skills</b>		
2.1	Data management.	Assignments	Questions and answers and problem solving in the class
2.2	Ability to construct the regression model	Problem solving in the class	Midterm and Final Examinations
2.3	To have understanding about the use of different techniques in the data analysis and their underlying assumptions under different situations.	Discussion on real life problems with specific strategies	Assignments
<b>3.0</b>	<b>Interpersonal Skills &amp; Responsibility</b>		
3.1	Work independently and as part of team during the class and discussion outside the class.	Discussion on the key issues of data analysis using different software, comparisons and limitations of the different packages.	Grading homework assignments
3.2	Participatory discussions in the class in order to develop their own views on some problems of interest and exchange of views.	Sharing and exchanging of views during on key features to increase the level of understanding	Discussion on the problems and comments from other students
3.3	Developing the communication skills through writing comments and	Providing practical examples and solving relevant	Grading the projects

	summarizing the findings and participatory interpersonal sharing of knowledge	problems through participatory approach and projects	
<b>4.0</b>	<b>Communication, Information Technology, Numerical</b>		
4.1	Use the computer for analyzing and processing the real data	Incorporating the use and utilization of computer in the course requirements through some assignments	Grading homework assignments
4.2	Use computational tools	Projects	Grading the projects
<b>5.0</b>	<b>Psychomotor</b>		
5.1	Not applicable	Not applicable	Not applicable

5. Schedule of Assessment Tasks for Students During the Semester			
	Assessment task (i.e., essay, test, quizzes, group project, examination, speech, oral presentation, etc.)	Week Due	Proportion of Total Assessment
1	Class activates ( in class quizzes, and homework)	weekly	12%
2	Major exams I	6	24%
3	Major exams II	12	24%
4	Final exam	16	40%

#### D. Student Academic Counseling and Support

<p>1. Arrangements for availability of faculty and teaching staff for individual student consultations and academic advice. (include amount of time teaching staff are expected to be available each week)</p> <ul style="list-style-type: none"> <li>• Office hours 3 hr/ week</li> <li>• Help through emails/discussions/consultations</li> </ul>
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#### E Learning Resources

<p>1. List Required Textbooks</p> <p>Kutner, M., Nachtsheim, C.J. and Neter, J. (2005). Applied Linear Regression Models, Fifth Edition, McGraw-Hill.</p>
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2. List Essential References Materials (Journals, Reports, etc.)

- 1- Draper, N.R. and Smith, H. (1998). Applied regression Analysis, John Wiley and Sons, New York.
- 2- Chatterjee, S and Hadi A. S., (2012) Regression Analysis by Example, 5-th Edition, John Wiley & Sons, Inc.
- 3- Weisberg S. (2005), Applied Linear Regression, 3rd Edition, John Wiley & Sons, Inc.

3. List Electronic Materials, Web Sites, Facebook, Twitter, etc.

- Websites on the internet that are relevant to the topics of the course

4. Other learning material such as computer-based programs/CD, professional standards or regulations and software.

- Multi-media associated with the text book and the relevant websites

## F. Facilities Required

Indicate requirements for the course including size of classrooms and laboratories (i.e. number of seats in classrooms and laboratories, extent of computer access, etc.)
1. Accommodation (Classrooms, laboratories, demonstration rooms/labs, etc.) <ul style="list-style-type: none"> <li>• Computer room containing at least 40 systems</li> </ul>
2. Technology resources (AV, data show, Smart Board, software, etc.) <ul style="list-style-type: none"> <li>• Data show</li> <li>• Smart Board</li> </ul>
3. Other resources (specify, e.g. if specific laboratory equipment is required, list requirements or attach list)

## G Course Evaluation and Improvement Processes

1. Strategies for Obtaining Student Feedback on Effectiveness of Teaching <ul style="list-style-type: none"> <li>• Course evaluation by student</li> <li>• Students- faculty meetings</li> </ul>
2. Other Strategies for Evaluation of Teaching by the Instructor or by the Department <ul style="list-style-type: none"> <li>• Peer consultation on teaching</li> <li>• Departmental council discussions</li> <li>• Discussions within the group of faculty teaching the course</li> </ul>
3. Processes for Improvement of Teaching <ul style="list-style-type: none"> <li>• Conducting workshops given by experts on the teaching and learning methodologies</li> <li>• Periodical departmental revisions of its methods of teaching</li> <li>• Monitoring of teaching activates by senior faculty members</li> </ul>
4. Processes for Verifying Standards of Student Achievement (e.g. check marking by an independent member teaching staff of a sample of student work, periodic exchange and remarking of tests or a sample of assignments with staff at another institution) <ul style="list-style-type: none"> <li>• Providing samples of all kind of assessment in the departmental course portfolio of each course</li> <li>• Assigning group of faculty members teaching the same course to grade same questions for various students. Faculty from other institutions are invited to review the accuracy of the grading policy</li> <li>• Conducting standard exams such as the American Mathematical Society exams</li> </ul>



or others

5. Describe the planning arrangements for periodically reviewing course effectiveness and planning for improvement.

- The course material and learning outcomes are periodically reviewed and the changes to be taken are approved in the departmental and higher councils.
- The head of department and faculty take the responsibility of implementing the proposed changes.

Name of Course Instructor: \_\_Prof. Khalaf Sultan\_\_\_\_\_

Signature: Khalaf Sultan Date Specification Completed: 10/2/2018

Program Coordinator: \_\_\_\_\_

Signature: \_\_\_\_\_ Date Received: \_\_\_\_\_