Course Specifications

General Information

Course name	Linear Models
Course number	STAT3317
Faculty	
Department	
Course type	Major Needs
Course level	3
Credit hours (theoretical)	3
Credit hours (practical)	0
Course Prerequisites	

Course Objectives

1 - To acquaint students with Least Square methods and concept of linear regression, correlation, and its applications
2 - To approach the material with matrices algebra
3 - To develop the ability to build regression models
4 - To acquaint students with transformations, qualitative variable in the model which broaden the use of linear regression theory
5 - Gain familiarity with use of modern statistical software packages for building a statistical model

Intended Learning Outcomes

Knowledge and Understanding	* Students will be able to understand method and concept of simple and multiple regression and correlation * Develop an understanding of the theoretical basis for regression analysis * Enable students to write simple and multiple linear regression models in matrix format * Students will be able to build regression models * Students will be able to present the results using available statistical software * Students will be able to make an oral presentation by PowerPoint on interdisciplinary issues relating to regression analyses

Course Contents

1 - Introduction to this course & Motivation Required Reading
2 - .Introduction, Statistical Model and their application
3 - Lest Square Method for simple linear regression and their properties. Estimation of models parameter
4 - Inference concerning parameters. Testing Hypothesis and Confidence Intervals. Concept of Prediction Interval
5 - Analysis of Variance and Coefficient of Determination R2 , Covariance and correlation concept
6 - .Diagnostics and Remedial, Non-linearity, Non-constancy of Error variance, Non-indepenendency, Transformations
7 - Review of matrix algebra
8 - Multiple Linear Regression, General linear Regression Model in matrix terms, qualitative predictor variables, ANOVA Table
9 - Inference, Prediction of new observation.. Diagnostics and Remedial measures
10 - Multicollinearity
11 - Polynomial Regression Model. Qualitiative Predictors
12 - Model selection, Criteria for Model selection, Search Procedure, Model adequacy

Teaching and Learning Methods

1 - Class meetings with expected participation and discussion
2 - Course documents, lectures and active classroom based discussion
3 - Interactive teaching methods
4 - Lab practical work and experiential learning through in class small groups work
5 - Cooperative leaning through student led presentations
6 - Take?home assignments and closed book exams
7 - Project preparation and Presentations
8 - Office hours
9 - Computer: Each student will need to have access to a computer or laptop to use statistical software to complete homework assignments and print off notes and readings

Students Assessment

Assessment Method	TIME	MARKS
First Exam	The Fifth Week	15%
Second Exam	Twelfth Week	15%
Assignments		10%
Project and PowerPoint Presentation	During the last week of classes	20%
First Exam	The Sixteenth Week	40%

Books and References

Course note	محاضرات من اعداد المحاضر
Essential books	الانحدار، د. ثروت محمد عبد المنعم محمد إبراهيم، مكتبة الانجلو المصرية،2005
Recommended books	مقدمة في تحليل الانحدار الخطي، د.أموري هادي كاظم ، محمد مناجد عيفان الدليمي جامعة بغداد، 1988
	Applied Linear Statistical Models, 5th ed,J.Neter, M.Kutner,C. Nachtsheim, W.Wasserman. Irwin, 2005
	Applied Linear Regression Models, 3rd ed,J.Neter, M.Kutner,C. Nachtsheim, W.Wasserman. Irwin, 1996
	Applied Linear Regression 3rd ed. By Alvin C. Rencher and G.Bruce Schaalje