STAT 3008
Applied Regression Analysis

1. Description:

This course introduces the general methodology in regression analysis. The use of statistical packages R will be demonstrated

2.   Learning outcomes

After finishing the course, students should be able to

- understand the matrix presentation of data
- understand the parameter estimation and hypothesis testing for a regression model
- build an ANOVA table for a regression model
- perform model selection
- perform model diagnostics
- use statistical software to analyze regression data

3.   Course Content

Topic	Contents/ concepts
1. Introduction	Idea of regression, Scatter plot
2. Simple Linear Regression	Estimation of regression parameters, Analysis of variance, Test for significance/confidence intervals for parameters, prediction
3. Multiple Regression	Estimation of regression parameters, Analysis of variance, Test for significance/confidence intervals for parameters, prediction
4. Drawing Conclusions	Interpretation of regression result
5. Weights, Lack of Fit	Weighted least square regression, test for lack of fit
6. Polynomial and factors	Polynomial regression, Factors
7. Transformations	The use of transformation to improve regression fit
8. Regression Diagnostics	The use of residuals in model assessment
9. Outlier and Influence	The influence of special observations on regression
10. Variable Selection	Select the best subset of variables for regression
11. Nonlinear Regression	Regression using nonlinear function of predictors
12. Logistic Regression	Regression when the response is a binary variable

4. Assessment Scheme

Type	Description	Weight
Assignment	4-5 assignments on problems solving	20%
Mid-term Examination	One two-hour written mid-term test, **Thursday 16/10**	30%
Final Examination	One two-hour written examination	50%

5. Tentative course schedule

Class/ week	Date	Topic
1	1 Sep	Topic 1
2	8 Sep	Topic 2
3	15 Sep	Topic 2
4	22 Sep	Topic 2
5	39 Sep	Topic 3
6	6 Oct	Topic 3
7	13 Oct	Mid-Term
8	20 Oct	Topic 4
9	27 Oct	Topic 5
10	3 Nov	Topic 6-7
11	10 Nov	Topic 8
12	17 Nov	Topic 9
13	24 Nov	Topic 10

6. Teachers' or TA's contact details

Instructor	
Name:	**Yau Chun yip**
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Tutor	
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7. Course materials

    a) Textbook: **Weisberg, S. 2005. Applied Linear Regression (3rd Ed.). John Wiley & Sons**
    b) Lecture notes and other course materials can be downloaded from the instructor's website.

8. Academic honesty and plagiarism

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