UNIVERSITI MALAYSIA PERLIS
Institut Matematik Kejuruteraan

Course Schedule for Engineering Statistics / EQT 271
(Academic Session I, 2014/2015)

Subject and Code : Engineering Statistics / EQT 271

Total Lecture Hours : 3 Hours (lecture) x 14 weeks
1 Hours (tutorial) x 14 weeks

Synopsis : This course introduces the fundamental concepts in statistics. The definition of statistics and basic concepts of statistics such as collection of data, data summary and presentation, probability distribution and sampling distribution will be introduced to the students in topic basic statistics. This course also teaches the students on how to make a statistical inference which are estimation and hypothesis testing. Apart from that, students will learn on how to run statistical test and analyze the results obtained. These skills will be taught in topic introductory linear regression (Simple linear regression, Least squares method, Test for linearity of regression and Pearson product moment correlation coefficient), analysis of variance (one-way and two-way ANOVA) and nonparametric statistics (The $\chi^2$ test, Sign test, Mann-Whitney test, Kruskal Wallis test, Wilcoxon-signed rank test and Spearman rank correlation).

Course Outcomes : At the end of this course the student should be able to:

1. Ability to **understand**, **apply** and **explain** the basic concepts of statistics.
2. Ability to **solve** problems using suitable statistical inference.
3. Ability to **construct** the model and **analyze** the result from ANOVA table and simple linear regression.
4. Ability to **apply** the basic methodology of nonparametric statistics to **solve** engineering problems.

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<th>Activities</th>
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<td>1-3</td>
<td><strong>CHAPTER 1</strong>&lt;br&gt;Basic Statistics&lt;br&gt;1.1 Statistics in Engineering&lt;br&gt;1.2 Collecting Engineering Data&lt;br&gt;1.3 Data Summary and Presentation&lt;br&gt;1.4 Probability Distributions&lt;br&gt;1.4.1 Discrete Probability Distribution&lt;br&gt;1.4.2 Continuous probability Distribution&lt;br&gt;Sampling Distributions of the Mean and Proportion</td>
<td>Lecture (3 hrs)&lt;br&gt;Tutorial (1 hrs)&lt;br&gt;<strong>Quiz1</strong></td>
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<td>4-6</td>
<td><strong>CHAPTER 2</strong>&lt;br&gt;Statistical inference&lt;br&gt;2.1 Estimation&lt;br&gt;2.1.1 Confidence interval estimation for Mean and Proportion&lt;br&gt;2.1.2 Determining sample Size&lt;br&gt;2.2 Hypothesis Testing&lt;br&gt;2.2.1 Tests for One and Two Means&lt;br&gt;2.1 2.2.2 Tests for One and Two Proportions</td>
<td>Lecture (3 hrs)&lt;br&gt;Tutorial (1 hrs)&lt;br&gt;<strong>Quiz 2</strong>&lt;br&gt;Mid Term Exam</td>
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<td>Week</td>
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| 7    | CHAPTER 3 Introductory Linear Regression  
|      | 3.1 Simple Linear Regression  
|      | 3.1.1 Scatter Diagram, Simple Linear Regression Model | Lecture (3 hrs)  
|      |                  | Tutorial (1 hrs)  
|      |                  | Quiz 3   |
| 8    | Mid-term break  |                      |            |
| 8-9  | 3.2 Least Squares Method  
|      | 3.3 Test for Linearity of Regression  
|      | 3.4 Pearson Product Moment Correlation Coefficient | Lecture (3 hrs)  
|      |                  | Tutorial (1 hrs)  
|      |                  | Assignment 1 |
| 10-11| CHAPTER 4 Analysis of Variance  
|      | 4.1 One-Way ANOVA  
|      | 4.2 Two-Way ANOVA | Lecture (3 hrs)  
|      |                  | Tutorial (1 hrs)  
|      |                  | Assignment 2 |
| 12-14| CHAPTER 5 Nonparametric Statistics  
|      | 5.1 The $\chi^2$ Tests:  
|      | 5.1.1 Goodness-of-fit Test  
|      | 5.1.2 Independence Test  
|      | 5.1.3 Homogeneity Test  
|      | 5.2 Nonparametric Statistics:  
|      | 5.2.1 Sign Test  
|      | 5.2.2 Mann-Whitney Test  
|      | 5.2.3 Wilcoxon-signed Rank Test  
|      | 5.2.4 Kruskal Wallis Test  
|      | 5.2.5 Spearman Rank Correlation | Lecture (3 hrs)  
|      |                  | Tutorial (1 hrs)  |
| 15   | Revision Week  |                      |            |
| 16-17| Final Exams    |                      |            |

**Evaluation:**

(i) **Peperiksaan/ Examination**: 70%

- **Final Examination** = 50%
- **Mid Term Examination** = 20%

(ii) **Penilaian Berterusan/ Continual Assessment**: 30%

- **Quizzes / Assignment** = 30%
  - i. **Quizzes** = 10%
  - ii. **Assignment** = 20%

**Textbook:**

(i) Statistics, McGraw Hill
Reference Books:


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