



UNIVERSITI TEKNOLOGI MARA

BCT575: BIOMETRY

Course Name (English)	BIOMETRY APPROVED
Course Code	BCT575
MQF Credit	3
Course Description	Biometry refers to the analysis of biological data using mathematical and statistical methods. This course discusses how statistics is used to answer questions raised in research. Main topics will be discussed include the roles of statistics, sampling and populations, hypothesis testing, designs of experiment and regression and correlation. In order to meet the objectives of understanding the computer output of statistical analysis, Statistical Analysis Software (SAS®) was chosen to show the programmes and outputs from the system.
Transferable Skills	Demonstrate ability to investigate problems and provide effective solutions
Teaching Methodologies	Lectures, Practical Classes, Discussion
CLO	<p>CLO1 Describe the processes and concerns involved in data gathering and the kinds of information that can be inferred from numerical data</p> <p>CLO2 Explain how data are objectively interpreted and understand common applications of quantitative methods in the scientific literature</p> <p>CLO3 Compute and interpret descriptive statistics from a variety of data and select appropriate statistical analyses for a variety of applications.</p> <p>CLO4 Carry out common tests of significance including t-tests and analysis of variance</p> <p>CLO5 Examine data relationships using correlation, regression, and contingency table analysis.</p> <p>CLO6 Use statistical calculators and computers for data analysis and apply critical thinking skills to the interpretation of data.</p>
Pre-Requisite Courses	No course recommendations
Topics	
1. Introduction to the course 1.1) Course contents	
2. The roles of statistics 2.1) The basic statistical procedure 2.2) The scientific method 2.3) Experimental data 2.4) Computer usage	
3. Populations, Samples and Probability Distributions 3.1) Populations and samples 3.2) Random sampling 3.3) Level of measurements 3.4) Computer usage	
4. Descriptive Statistics 4.1) Mean, median and mode 4.2) Variance and standard deviation 4.3) Coefficient of variation 4.4) Graphical presentation 4.5) Computer usage	

5. Normal distribution

- 5.1) The standard normal distribution
- 5.2) Inference from a single observation
- 5.3) The central limit theorem
- 5.4) Inferences about a population mean and variance
- 5.5) Computer usage

6. Student's t Distribution

- 6.1) The nature of t distribution
- 6.2) Inference about a single mean
- 6.3) Inference about two means
- 6.4) Computer usage

7. One-Way Analysis of Variance, Regression and Correlation

- 7.1) The additive models
- 7.2) One-way analysis of variance
- 7.3) Multiple comparison procedures
- 7.4) Regression analysis
- 7.5) Correlation analysis
- 7.6) Computer usage

8. Other Analysis of Variance Designs

- 8.1) Completely Randomized Design (CRD)
- 8.2) Randomized Complete Block Design (RCBD)
- 8.3) Factorial experiment
- 8.4) Computer usage

Assessment Breakdown	%
Continuous Assessment	50.00%
Final Assessment	50.00%

Details of Continuous Assessment	Assessment Type	Assessment Description	% of Total Mark	CLO
	Assignment	Assignment 1	5%	CLO2 , CLO3
	Assignment	Assignment 2	5%	CLO4 , CLO5
	Lab Exercise	Lab reports 1 -8	10%	CLO2 , CLO3 , CLO4
	Test	Test 1	15%	CLO1 , CLO2 , CLO3
	Test	Test 2	15%	CLO4 , CLO5 , CLO6

Reading List	Recommended Text	<ul style="list-style-type: none"> S. M. Dowdy, Stanley Wearden 1991, <i>Statistics for research</i>, Wiley-Interscience [ISBN: 0-471-85703-3] Susan J. Slaughter, Lora D. Delwiche 2010, <i>The Little SAS Book for Enterprise Guide 4.2</i>, SAS Press [ISBN: 9781599947266]
	Reference Book Resources	<ul style="list-style-type: none"> Charlesworth, B, Charlesworth, D, <i>Elements of Evolutionary Genetics</i>, Second Edition Ed. [ISBN: 978-0-981519] Michael H K., Neter, N. 2004, <i>Applied Linear Regression Models Revised Edition with Student CD-ROM</i>, McGraw-Hill Europe [ISBN: 0071115196] Rees, D.G 1989, <i>Essential Statistics</i>, CRC Press [ISBN: 0412320304] <i>SAS User's Guide</i> [ISBN: 9780917382376]

Article/Paper List	Recommended Article/Paper Resources	<ul style="list-style-type: none"> Suratman, M.N, GQ Bull, DG Leckie, VM Lemay, PL Marshall, MR Mispan 2004, Prediction models for estimating the area, volume, and age of rubber (<i>Hevea brasiliensis</i>) plantations in Malaysia using Landsat TM data, <i>International Forestry Review</i>, 6 (1), 1 [ISSN: 1465-5489] http://www.ingentaconnect.com/content/cfa/ifr
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Other References	This Course does not have any other resources
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