FACULTY OF COMPUTER AND MATHEMATICAL SCIENCES

SCHEME OF WORK

COURSE : **STATISTICS FOR BUSINESS AND SOCIAL SCIENCES (STA 404)**

EFFECTIVE DATE : **MARCH 2022**

SEMESTER : **October 2022 – February 2023**

Course Learning Outcome

1. Describe the concepts on given problems related to statistics for business and social sciences (C2).
2. Determine appropriate method to solve given problems related to statistics for business and social sciences (C5).
3. Demonstrate interpersonal skills in a group work related to statistics for business and social sciences (A3).

Course Description

This course introduces the students to the basic and intermediate methods of data analysis. It emphasis on the use of descriptive and inferential statistics including numerical descriptive, estimation, hypothesis testing, analysis of variance, chi-square test of independence and regression. Students will be exposed to analysis using statistical software, and interpretation of output.

TOPICS TO COVER

Week	Topics and Sub-Topics	No. of Hours	Remarks
1 [11/10 – 14/10]	**1.0 Introduction to Statistics** 1.1 What is Statistics 1.2 Descriptive and Inferential Statistics 1.3 Variable, Types of Data, and Level of Measurement 1.4 Data Collection Methods (telephone surveys, mailed questionnaire surveys, and personal interview) 1.5 Types of sampling (simple random sampling, stratified, systematic, cluster, convenience, quota, judgmental, and snowball)	2	
	Tutorial	2	**Complete Entrance Survey (11th October – 1st November 2022)**
2 [17/10 – 21/10]	**2.0 Descriptive Statistics** 2.1 Organizing data (bar chart, pie chart, stem and leaf, box whisker plot, frequency distribution table and histogram) 2.2 Numerical Descriptive Measures (ungrouped data) 2.1.1 Measures of Central Tendency (mean, median, mode)	2	
	Tutorial	2	
3 [24/10 – 28/10]	2.1.2 Measures of Variation (range, standard deviation, variance, coefficient of variation) 2.1.3 Measure of Skewness 2.1.4 Measures of Position (Q1, Q2 and Q3)	2	
	Tutorial	2	

4
[31/10 – 4/11]
	3.0 Estimation
	
	3.1 Sampling Distribution of the Mean
	3.2 Interval Estimation for a Mean (covered both σ known and unknown)
	  • Small Sample
	  • Large Sample
		2	

	Tutorial	2	

5
[7/11 – 11/11]
	3.3 Interval Estimation for the Difference Between Two Means (covered both σ known and unknown)
	  • Small Sample
	  • Large Sample
		2	

	Tutorial	2	
6 **[14/11– 18/11]**	3.4 Interval Estimation for the Difference Between Two Means (Dependent Sample)	2	
	Tutorial	1	
	Quiz	1	
Midterm Break **21ˢᵗ – 27ᵗʰ November 2022**			

7
[28/11 – 2/12]
	4.0 Hypothesis Testing
	
	4.1 Test of Mean Difference
	    4.1.1 Concept of Hypothesis
	    4.1.2 Testing for a Mean
		2	

	Tutorial	2	

8
[5/12 – 9/12]
	4.1.3 Testing the Difference Between Two Means
	     (large sample)
	
	4.1.4 Testing the Difference Between Two Means
	    (independent variables)
	    Equal variances. ($\sigma_1^2 = \sigma_2^2$)
		2	

	Tutorial	2	

9
[12/12 – 16/12]
	4.1.5 Testing the Difference Between Two Means
	    (independent variables)
	    Unequal variances. ($\sigma_1^2 \neq \sigma_2^2$)
		2	

	Tutorial	2	
10 [19/12 – 23/12]	4.1.6 Testing the Difference Between Two Means (dependent sample)	2	
	Tutorial	2	
Special Holiday **26th December 2022 – 1st January 2023**			

Week	Topic	Hours	Remarks
11 [2/1 – 6/1]	4.1.7 Testing for the Difference Among More Than Two Means (One-Way Analysis of Variance)	2	
	Tutorial	2	
12 [9/1 – 13/1]	4.2 Test for Independence	2	
	Tutorial **Group Project Submission**	2	**Complete Exit Survey (9th – 22nd January 2023)**

13
[16/1 – 20/1]
	5.0 Bivariate Analysis
	
	5.1 Correlation
	   5.1.1 Scatter diagram
	   5.1.2 Pearson product moment correlation
	      coefficient
		2	**SuFO – 20th January – 24th February 2023**

	Tutorial	2	

14
[23/1 – 27/1]
	5.2 Simple Linear Regression
	    5.2.1 An overview of regression
	
	5.3 Estimating Linear Regression Using Least Square
	    Method
	
	5.4 Coefficient of determination, r^2
		2

	Test	2
Revision Week **30th January – 5th February 2023**		**1 week**
Final Examination/ Final Assessment **6th February – 21st February 2023**		**3 weeks**
Semester Break **22nd February – 19th March 2023**		**5 weeks**

ASSESSMENT INFORMATION

Assessment	Name of Assessment	Suggested Topic	Full Marks	Weighted	NOTE
1	Quiz	1 – 3	30	<u>10%</u>	**Duration: 1 hour**
2	Test	4 – 5	50	<u>30%</u>	**Duration: 1 hour and 40 minutes**
3	Group Project		50	<u>20%</u>	**Refer Guidelines**
4	Final Examination	1 – 5	60	<u>40%</u>	**Duration: 2 hours**
Total				<u>**100%**</u>	

RECOMMENDED TEXT

Allan G.Bluman, Elementary Statistics: A Step by Step Approach, 10th ed., McGraw-Hill Education, 2018, ISBN: 9781259922015

REFERENCES

1. Kieth A. Carlson & Jennifer R. Winquist, An Introduction to Statistics: An Active Learning Approach, 2nd ed., SAGE Publications Inc., 2017, ISBN: 978148337873
2. Evan M. Berman & XiaoHu Wang, Exercising Essential Statistics, 4th ed., SAGE Publications Inc., 2017, ISBN: 978-150634895
3. Neil Weiss, Introductory Statistics, 10th ed., Pearson Education Inc., 2017, ISBN: 9780321989178
4. Ronald E.Walpole, Raymond H.Myers, Sharon L.Myers & Keying Ye, Probability and Statistics for Engineers and Scientist, 9th ed., Pearson Education Inc., 2017, ISBN: 978933251908
5. John Murdoch & John Anthony Barnes, Statistical Tables for Students of Science, Engineering, Psychology, Business, Management, Finance, 4th ed., Macmillan Education, 1998, ISBN: 9780333558591