COURSE OUTLINE

Department/ Faculty:	Computer Science/ Computing	**Page:**	1 of 6
Course code:	SCSI 2143	**Academic Session/Semester:**	2018019/2
Course name:	PROBABILITY & STATISTICAL DATA ANALYSIS	**Pre/co requisite:**	-
Credit hours:	3		

Course synopsis	This course is designed to introduce some statistical techniques as tools to analyse the data. In the beginning the students will be exposed with various forms of data. The data represented by the different types of variables are derived from different sources; daily and industrial activities. The analysis begins with the data representation visually. The course will also explore some methods of parameter estimation from different distributions. Further data analysis is conducted by introducing the hypothesis testing. Some models are employed to fit groups of data. At the end of course the students should be able to apply some statistical models in analysing data using available software.
Course coordinator (if applicable)	Dr. Suhaila Mohamad Yusuf

Course lecturer(s)/ Section	**Name**	**Office**	**Telephone (07) 55-**	**E-mail @utm.my**
Sec 01, 03, 04	Dr. Yusliza Yusoff			yusliza
Sec 02	Dr. Sharin Hazlin Huspi			sharin
Sec 05, 08	Dr. Suhaila Mohamad Yusuf	N28-438-22	32061	suhailamy
Sec 07, 09	Dr. Nor Azizah Ali			nzah
Sec 10	Prof. Madya Dr. Azlan Mohd Zain			azlanmz

Mapping of the Course Learning Outcomes (CLO) to the Programme Learning Outcomes (PLO), Teaching & Learning (T&L) methods and Assessment methods:

No.	**CLO**	**PLO (ICGPA CODE)**	**Weight (%)**	***Taxonomies and **generic skills**	**T&L methods**	**Assessment methods*** **
CLO1	Use the statistical concept and tool to summarize for different types of data in meaningful way using descriptive statistics.	PLO1 (KW) PLO3 (PS) PLO4 (CS)	31	C3	Lecture, Active learning, Project-based learning	FE, Q, ASG, GR1, T
CLO2	Evaluate appropriate hypothesis tests and draw inference from data	PLO1 (KW) PLO3 (PS)	33	C5	Lecture, Active learning	Q, ASG, FE
CLO3	Apply statistical techniques to analyse the relationship of different variables.	PLO1 (KW) PLO3 (PS) PLO4 (CS)	36	C3, CS1,CS2	Lecture, Active learning, Project-based learning	Q, ASG, FE, GR2

Refer *Taxonomies of Learning and **UTM's Graduate Attributes for measurement of outcomes achievement.
***T – Test; Q – Quiz; HW – Homework; L – Lab, GR – Group Project; PR – Personal Report; F – Final Exam etc.

Prepared by: Name: Dr. Noorfa Haszlinna Mustafa (Course Owner) Signature: Date: 21 August 2017	Certified by: Name: PM. Dr. Norafida Ithnin (Head of Department) Signature: Date:

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Details on Innovative T&L practices:

No.	Type	Implementation
1.	Active learning	Conducted through in-class activities
2.	Project-based learning	Conducted through project assignment. Tasks are given in sequential steps throughout the semester. Students in a group of 4/5 are given opportunity to collect data and perform some analysis and present it in suitable manner. The report must be given in the form of written report.

Weekly Schedule:

Week 1 27 Jan – 2 Feb	**Chapter 1: Introduction to Statistics** **1.1: Introduction** 1.1.1 Descriptive and Inferential Statistics. 1.1.2 Population and Sample. **1.2: Data** 1.2.1 Data Analysis Process. 1.2.2 Data Sources (Primary and Secondary data). 1.2.3 Types of Data (Qualitative, Quantitative, Discrete and Continuous data). 1.2.4 Data Scale and Measurement (Nominal, Ordinal, Interval, Ratio).	
3 Feb – 9 Feb	**CHINESE NEW YEAR BREAK (1 WEEK)**	
Week 2 10 Feb – 16 Feb	**Chapter 2: Data Description** **2.1: Presenting Qualitative Data** 2.1.1 Frequency Distributions, Bar and Pie Charts. **2.2: Presenting Quantitative Data** 2.2.1 Frequency Distributions, Histograms, Stem-and-Leaf, Box Plot.	***Project 1 Briefing***
Week 3 17 Feb – 23 Feb	**Chapter 3: Descriptive Statistics** **3.1: Measurement of Central Tendency** 3.1.1 Mean, Median, Mode, Quartile and Percentile. **3.2: Measurement of Dispersion** 3.2.1 Range, Variance, Standard Deviation. 3.2.2 Skewness and Kurtosis.	
Week 4 24 Feb – 2 Mar	**Lab Session: Introduction to Statistical Tools** **Topic 1: Introduction** **Topic 2: Basic Analysis**	***Quiz 1 (Descriptive Statistics)***

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	i. Frequencies Analysis. ii. Descriptive Analysis.	
Week 5 3 Mar – 9 Mar	**Chapter 4: Probability, Random Variables and Probability Distributions** **4.1: Probability** 4.1.1 Overview of Probability. **4.2: Random Variables and Probability Distributions** 4.2.1 Discrete and Continuous Random Variables. 4.2.2 Discrete and Continuous Variables Probability Distribution. 4.2.3 Binomial, Geometric and Poisson Distributions. 4.2.4 Normal Distribution.	***Assignment 1***
Week 6 10 Mar – 16 Mar Week 7 17 Mar – 23 Mar	**Chapter 5: Hypothesis Testing** **5.1: Point Estimation** 5.1.1 Point Estimator 5.1.2 Interval Estimator	***Project 1 Presentation*** ***Mid Term Test (22 March 2018)***
Week 8 24 Mar – 30 Mar	**MID TERM BREAK (2 DAYS – 27TH & 28TH MARCH)**	
Week 9 31 Mar – 6 Apr Week 10 7 Apr – 13 Apr	**5.2: Hypothesis Testing for 1 Sample** 5.2.1 Hypothesis Statement and Decision Rule 5.2.2 Errors of Decision 5.2.3 Hypothesis Testing **5.3: Hypothesis Testing for 2 Samples** 5.3.1 Hypothesis Statement 5.3.2 Hypothesis Testing	***Quiz 2 (Point Estimator) (Week 9)*** ***Project 2 Briefing***
Week 11 14 Apr – 20 Apr	**Chapter 6: Chi-Square Test and Contingency Analysis** **6.1: Multinomial Experiment and Goodness-of-Fit Test** 6.1.1 Multinomial Experiment 6.1.2 Goodness-of-Fit Test **6.2: One-way Contingency Table** 6.2.1 Categories with equal frequencies/probabilities 6.2.2 Categories with unequal frequencies/probabilities **6.3: Two-way Contingency Table** 6.3.1 Chi-Square Test of Independence	***Quiz 3 (Hypothesis Testing for 1 Sample)*** ***Assignment 2***

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Week 12 21 Apr – 27 Apr	**Chapter 7: Correlation and Regression** **7.1: Correlation** 7.1.1 Correlation Analysis. 7.1.2 Pearson's Correlation. 7.1.3 Spearman's Correlation. **7.2: Regression** 7.2.1 Types of Regression Models. 7.2.2 Population Linear Regression. 7.2.3 The Least Square Equation. 7.2.4 Coefficient of Determination. 7.2.5 Standard Error and Standard Deviation.	***Quiz 4 (Chi-Square Test) (Week 12)*** ***Assignment 3***
Week 13 28 Apr – 4 May		
Week 14 5 May – 11 May	**Chapter 8: Analysis of Variance (ANOVA)** **8.1: One-way ANOVA** 8.1.1 ANOVA with Equal Sample Sizes. 8.1.2 ANOVA with Unequal Sample Sizes **8.2: Two-way ANOVA** 8.2.1 Assumptions and Procedures.	***Project 2 Presentation***
Week 15 12 May – 18 May	**REVISION WEEK (3 DAYS – 14TH, 15TH & 16TH MAY)**	

Transferable skills (generic skills learned in course of study which can be useful and utilised in other settings):

Communication Skills and Thinking Skill

Student learning time (SLT) details:

Distribution of course content	Teaching and Learning Activities						TOTAL SLT
	Guided Learning (Face to Face)				Guided Learning Non-Face to Face	Independent Learning Non-Face to face	
CLO	**L**	**T**	**P**	**O**			
CLO 1	9	2				23	**34**
CLO 2	12	3				22	**37**
CLO 3	13	3				25	**41**
Total SLT	**34**	8				**70**	**112**

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Continuous Assessment		PLO	Percentage	Total SLT
1	ASG (3)		(3X5)= 15	As in CLO
2	Quiz (4)		(5X4) = 20	**2h**
3	Test		15	**2h**
4	Project 1		5	As in CLO
5	Project 2		5	As in CLO
Final Assessment			Percentage	Total SLT
1	Final Exam		40	**3**
Grand Total SLT				**120h**

Special requirement to deliver the course (e.g: software, nursery, computer lab, simulation room):

- **SPSS**
- **R**

Learning resources:

Text book (if applicable)

Main references

1. Roxy Peck, Chris Olsen, Jay Devore, Introduction to Statistics and Data Analysis, 4th Edition, Brooks/Cole Cengage Learning, 2012.
2. Mario F. Triola, Elementary Statistics, 12th Edition, Pearson, 2012.
3. Neil A. Weiss, Elementary Statistics, 8th Edition, Pearson, 2011.

Additional references

Any suitable Statistics website and books.

Online

http://elearning.utm.my

Academic honesty and plagiarism:

Assignments are individual tasks and NOT group activities (UNLESS EXPLICITLY INDICATED AS GROUP ACTIVITIES). Copying of work (texts, lab results etc.) from other students/groups or from other sources is not allowed. Brief quotations are allowed and then only if indicated as such. Existing texts should be reformulated with your own words used to explain what you have read. It is not acceptable to retype existing texts and just acknowledge the source as a reference. Be warned: students who submit copied work will obtain a mark of **zero** for the assignment and exams and disciplinary steps may be taken by the Faculty. It is also unacceptable to do somebody else's work, to lend your work to them or to make your work available to them to copy.

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Other additional information (Course policy, any specific instruction etc.):

1. Attendance is compulsory and will be taken in every lecture session. Student with less than 80% of total attendance is not allowed to sit for final exam.
2. Students are required to behave and follow the University's dressing regulation and etiquette all the time.
3. Exercises and tutorial will be given in class and some may be taken for assessment. Students who do not do the exercise will lose the coursework marks for the exercise.
4. Assignments must be submitted on the due dates. Some points will be deducted for late submissions. Assignments submitted three days after the due date will not be accepted.
5. Make up exam will not be given, except to students who are sick and submit medical certificate confirmed by UTM panel doctors. Make up exam can only be given within one week of the initial date of exam.

			PLO1			PLO3			PLO4		
No.	**Assessment**	**%**	**CLO1**	**CLO2**	**CLO3**	**CLO1**	**CLO2**	**CLO3**	**CLO1**	**CLO2**	**Total**
1	ASG1	**5**	5								**5**
2	ASG2	**5**		5							**5**
3	ASG3	**5**						5			**5**
4	Q1	**5**	5								**5**
5	Q2	**5**		5							**5**
6	Q3	**5**		5							**5**
7	Q4	**5**			5						**5**
8	T	**15**	10			5					**15**
9	GR1	**5**							5		**5**
10	GR2	**5**								5	**5**
11	F	**40**		7	20		8	5			**40**
Overall Total			**20**	**22**	**25**	**5**	**8**	**10**	**5**	**5**	**100**
			67			23			10		

Disclaimer: