Department/ Faculty:	Applied Computing and Artificial Intelligence/ Computing	**Page:**	1 of 8
Course code:	SECI 1143	**Academic Session/Semester:**	20242025/2
Course name:	PROBABILITY & STATISTICAL DATA ANALYSIS	**Pre/co requisite:**	-
Credit hours:	3		

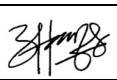
COURSE INFORMATION

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 Nur Eiliyah @ Wong Yee Leng

Course lecturer(s)/ Section		**Name**	**Office**	**Telephone (07) 55-**	**E-mail**
01	SECBH	Dr Sharin Hazlin Binti Huspi			sharin@utm.my
02	SECPH	Dr. Nies Hui Wen /Dr. Shamini			huiwennies@utm.my
03	SECPH/ SECVH	Assoc. Prof. Dr. Azlan bin Mohd Zain			azlanmz@utm.my
04	SECRH	Dr. Nur Eiliyah @ Wong Yee Leng			nureiliyah@utm.my
05		Assoc. Prof. Dr. Azurah binti Abu Samah			azurah@utm.my
06		Dr. Nur Eiliyah @ Wong Yee Leng			nureiliyah@utm.my
07	SECVH/ Y1S1 SECRH	Dr. Seah Choon Sen			seahcs@utm.my
08	SECVH	Dr. Seah Choon Sen			seahcs@utm.my

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

No.	**CLO**	**PLO (ICGPA CODE)**	***Taxonomies and **generic skills**	**T&L methods**	**Assessment methods*** **
CLO1	Use the statistical concept and tool to summarize different types of data in a meaningful way using descriptive statistics.	PLO1 (KW) PLO3 (PS) (30%)	C3	Lecture, Active learning, Project-based learning	Quiz 1 (5%) ASG 1 (5%) GR 1(5%) Test (15%)

Prepared by:		Certified by:	
Name:	Dr. Nor Azizah Ali	Name:	
Signature:		Signature:	
Date:		Date:	

COURSE OUTLINE

CLO2	Evaluate appropriate hypothesis tests and draw inference from data.	PLO1 (KW) PLO3 (PS) (37%)	C5	Lecture, Active learning	Quiz 2(5%) ASG 2 (5%) GR 2(7%) Final (20%)
CLO3	Apply statistical techniques to analyse the relationship of different variables.	PLO1 (KW) PLO3 (PS) PLO4 (CS) (33%)	C3, CS1, CS2	Lecture, Active learning, Project-based learning	ASG 3 (5%) ASG 4 (5%) Final (20%) GR 2(3%)
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.					

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 the opportunity to collect data and perform some analysis and present it in a suitable manner. The report must be given in the form of written report.

Weekly Schedule:

WEEK / DATE	TOPICS	ACTIVITIES
WEEK 1 17 – 21 Mar 25 ** Sultan of Johor's Birthday (23/3 - Sunday)* *Online*	**Chapter 1: Introduction to Statistics** **1.1: Introduction** 1.1.1 Descriptive and Inferential Statistics. 1.1.2 Population and Sample.	
WEEK 2 24 – 28 Mar 25 *Online*	**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).	**GROUP PROJECT 1 BRIEFING**

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WEEK / DATE	TOPICS	ACTIVITIES
WEEK 3 31 Mar –04 Apr 25 **Hari Raya AidilFitri (31/3 & 1/4 - Monday & Tuesday)* *Online*	**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.	
WEEK 4 07 – 11 Apr 25 *Physical*	**Chapter 3: Descriptive Statistics** **3.1: Measurement of Central Tendency** 3.1.1Mean, Median, Mode, Quartile and Percentile. **3.2: Measurement of Dispersion** 3.2.1 Range, Variance, Standard Deviation. 3.2.2 Skewness and Kurtosis.	**ASSIGNMENT 1** (Chapter 1-2) (5%) One hour of exercise/tutorial each week, starting from week 4.
WEEK 5 14 – 18 Apr 25 *Physical*	**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.	**QUIZ 1** (Chapter 3) (5%) **ASSIGNMENT 2** (Chapter 3-4) (5%)
WEEK 6 21 – 25 Apr 25	**Lab Session: Introduction to Statistical Tools (R Programming)** **Topic 1: Introduction** **Topic 2: Basic Analysis** i. Frequencies Analysis. ii. Descriptive Analysis.	**SUBMISSION: PROJECT 1 (5%)** **Mid-Term Test:** Date: 22 April 2025 Day: Tuesday Venue: bilik kuliah N28 dan Dewan Kejora Time: 8 pm-9.30 pm (15%)

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COURSE OUTLINE

WEEK / DATE	TOPICS	ACTIVITIES
WEEK 7 28 Apr – 02 May 25 **Labour Day (1/5 - Thursday)*	**Chapter 5: Hypothesis Testing** **5.1: Point Estimation** 5.1.1 Point Estimator 5.1.2 Interval Estimator	
WEEK 8 05 – 09 May 25	**MID-SEMESTER BREAK**	
WEEK 9 12 – 16 May 25 **Wesak Day (12/5 - Monday)*	**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	**GROUP PROJECT 2 BRIEFING**
WEEK 10 19 – 23 May 25		
WEEK 11 26 – 30 May 25	**5.3: Hypothesis Testing for 2 Samples** 5.3.1 Hypothesis Statement 5.3.2 Hypothesis Testing	~~**ASSIGNMENT 3**~~ ~~(Chapter 5- 6)~~ ~~(5%)~~
WEEK 12 02 – 06 June 25 **Agong's Birthday (2/6-Monday)* **Hari Raya Haji (7/6 –Saturday)*		~~**QUIZ 2**~~ ~~(Chapter 5.1 – 5.2)~~ ~~(5%)~~
WEEK 13 09 – 13 June 25	**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 2** (Chapter 5.1 – 5.2) (5%) **ASSIGNMENT 3** (Chapter 5- 6) (5%)
WEEK 14 16 – 20 June 25	**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.	**ASSIGNMENT 4** (Chapter 7) (5%)

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WEEK / DATE	TOPICS	ACTIVITIES
	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.	~~**SUBMISSION: PROJECT 2 (10%)**~~
WEEK 15 23 – 27 June 25 **Awal Muharram (27/6 – Friday)*	**Chapter 8: Analysis of Variance (ANOVA)** **One-way ANOVA** 8.1 ANOVA with Equal Sample Sizes. 8.2 ANOVA with Unequal Sample Sizes	**SUBMISSION: PROJECT 2 (10%)** **PROJECT 2 PRESENTATION**
WEEK 16 30 June – 06 July 2025	**STUDY WEEK**	
WEEK 17 – 19 07 July – 27 July 25	**FINAL EXAM WEEK**	

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	15h				5h	16h	**36h**
CLO 2	14h				10h	20h	**44h**
CLO 3	13h				4h	20h	**37h**
Total SLT	**42h**				**19h**	**56h**	**117h**

Continuous Assessment		PLO	Percentage	Total SLT
1	Assignment 1	PLO3	5	As in CLO1
2	Assignment 2	PLO1	5	As in CLO2
3	Assignment 3	PLO3	5	As in CLO3

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4	Assignment 4	PLO3	5	As in CLO3
5	Quiz 1	PLO1	5	**½ h**
6	Quiz 2	PLO3	5	**½ h**
7	Test	PLO1	10	**2h**
8		PLO3	5	
9	GR 1	PLO3	5	As in CLO1
10	GR 2	PLO3	7	As in CLO2
11		PLO4	3	As in CLO3
Final Assessment			**Percentage**	**Total SLT**
12	Final Exam	PLO1 PLO3	20 20	**3h**
			Grand Total SLT	**120h**

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

- ***R*** software

Learning resources:

Text book (if applicable)

Main references

1. Roxy Peck, Chris Olsen, Jay Devore, Introduction to Statistics and Data Analysis, 6th Edition, Brooks/Cole Cengage Learning, 2019.
2. Bowerman *et.al*, Business Statistics and Analytics in Practice,9th Edition, McGraw Hill Education, 2019.
3. Neil A. Weiss, Elementary Statistics, 10th Edition, Pearson, 2017.
4. Mario F. Triola, Elementary Statistics, 13th Ed. Pearson, 2018.

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

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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.

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**	**CLO3**	**Total**
1	ASG1	**5**	5							**5**
2	ASG2	**5**		5						**5**
3	ASG3	**5**						5		**5**
4	ASG4	**5**						5		**5**
5	Q1	**5**	5							**5**
6	Q2	**5**					5			**5**
7	Test	**15**	10			5				**15**
8	GR1	**5**	5							**5**
9	GR2	**10**		7					3	**10**
10	Final	**40**			10		20	10		**40**
Overall Total			**25**	**12**	**10**	**5**	**25**	**20**	**3**	**100**
			47			50			3	

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COURSE OUTLINE

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REVIEW OF L&T ACTIVITIES TO INCLUDE ONLINE LEARNING

Course learning outcome	Guided Learning FTF hours (from CI)	Guided Learning FTF hours completed	Online Learning hours			
			Activities	**Type of time spent**	**Estimated time**	**Total time**
CLO1 Use the statistical concept and tool to summarize for different types of data in meaningful way using descriptive statistics.	15	0	15			
			Online lecturing through Webex meeting platform Chapter 1-2.	The time spent in synchronous live interaction	2 hours (Chap 1.1) 3 Hours (Chap 1.2) 3 Hours (Chap 2)	8 hours
			Live Interaction with students to brief assignment instruction and give feedback on assignment progress	The time spent in synchronous live interaction	2 hours (Project)	2 hours
			Live interaction with to discuss with Students including online quiz	Time spent for instructional activities	1 hour (Quiz) 2 hours (Chap 1.2) 2 hours (Chap 2)	5 hours