

Faculty of Engineering, Science and Technology

COURSE GUIDE

EB 3125: Statistics

BBIOT/BIT/BIECC

Academic Year 2020

CONTENTS

- Introduction to the Course
- Contact Details of Lecturer(s) & Tutor(s)
- Course Syllabus (MQA Table 4) *Refer Attachment*
- Lecture schedule by week
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- Warning of plagiarism, syndication and cheating

Module Introduction by the Module Leader

Hi, welcome to EB3125 –Statistics. This course is to introduces students to descriptive and inferential statistics. This will include description of data, probability, probability distributions, sampling distributions, estimation of parameters, statistical testing of hypotheses, regression and correlation.

Nur Suaidah Rosli Course Leader

Contact Details of Lecturer

Name: Ms. Nur Suaidah Rosli

Room: S213

Email: nursuaidah@nilai.edu.my Tel: 06-8502338 (ext. 411)

Consultation Hours: Thusrday 2 pm - 4 pm & Friday 10 am - 12 pm

1.	Name of Course :	STATISTICS																			
2.	Course Code : Synopsis :	EB 3125 This course	Introduces st	udents to des	criptive stati:	stics. This will	include desc	cription of dat	ta, probability	, probability	distributions	, sampling di	stributions, st	atistical testi	ng of hypothe	eses, regressio	on and correlation				
3.	Name(s) of academic staff	Nur Suaidah	Nur Suardah Royli																		
4.	Somerter and Year																				
5.	Semester and Year offered : Credit Value :	3		Semester			1	Ye	ear	1											
6.	Prerequisite/co-requisite: (If any)	None																			
7.	Course Learning Outcome (example) - explain the b	s (CLO) : At the	he end of the	course the stu	udents will be	able to:															
			ICLO): At the end of the course the students will be able to: sic principles of immunisation (C2,PLO1)																		
	CLO1	explain basic statistical concepts such as frequency distribution, graphical presentation of data, measure of central to							of central te	endency and d	lispersion, co	rrelation and	regression ar	nalysis. (C1, PL	.02)						
	CLO2	solve statistical problems by using suitable methods.(C3, PLO2)																			
	CLO3	apply samp	ling theory, d	iscrete and co	ntinuous pro	bability distr	ibutions, and	l hypothesis te	esting. (C3,PL	(02)											
8.	Mapping of the Course Lea	arning Outco	mes to the Pr	ogramme Lea	rning Outcor	nes, Teaching	Methods an	d Assessment	t:												
								Programme	Learning Ou	tromes (PLC	2)										
	Course Learning Outcomes (CLO)	PLO1	PLO2	PLO3	PLO4	PLO5	PLO6	PLO7	PLOS	tcomes (FEC	Ï						Teaching Methods	Assessment			
	CLO 1		√														Lecture/	Assignment/ Test / Quizzes			
																	Tutorials	/Final Examination			
	CLO 2		V														Lecture/ Tutorials	Assignment/ Test /Final Examination			
																	Tutorials	Examination			
	CLO 3		√														Lecture/ Tutorials	Assignment/ Test / Quizzes /Final			
	CLO 3		, v														Tutorials	/Final Examination			
		1											1								
	Indicate the relevancy bet	ween the CL	O and PLO by	ticking "/" the	appropriate	relevant box															
9	(This description must be	read togethe	r with Standa	ards 2.1.2 , 2.2.	1 and 2.2.2 in	Area 2 - pag					Problem 5-1	lving and Scie	ntific Skiller								
	Transferable Skills (if appli (Skills learned in the cours	e of study wh	nich can be us	eful and utiliz	ed in other se	ettings)				2	em 30	g and sele	Jenna;								
10.	Distribution of Student L	earning Tim	ne (SLT)							3											
														anch'	Learning Ac	+lv!+!					
														eaching and irning (F2F)	Learning Ac	Guided					
				Cours	e Content O	utline					CLO*	L	т.	Р	0	(NF2F) eq:	Independent Learning (NF2F)	SLT			
	1.Introduction															eg: e-Learning					
	1.Introduction - What is statistics? - Types of statistics - Population vs Sample - Some terms in statistics - Types of variables - Types of data										CL01	2	,					_			
	- Some terms in statistics - Types of variables										CLOT		'				3	6			
	- Types of data 2. Planning for Research ar	nd Organising	g Data								-										
	2. Planning for Research ar - Collection of data/Techni - Sampling and non-sampling - Organising and graphing - Pie Chart, Bar Chart, Com - Organising and graph - Histogram - Grouped and ungrouped	iques of samp ling errors	pling																		
	Pie Chart, Bar Chart, Com Organising and graph	ponent Bar C ning quantita	hart, Multiple tive data	Bar Chart							CL01,CL02	3	2				3	8			
	Histogram Grouped and ungrouped Cumulative frequency di	frequency di	stribution																		
	3. Numerical Descriptive I - Statistical Measures of U - Measures of Central Tenc - Measures of Dispersion - Statistical Measures of - Measures of Central Tenc - Measures of Dispersion - Measures of Sekweness - Chebyshev's Theorem	ngrouped Da lency	ita																		
	 Statistical Measures of Measures of Central Tend 	f Grouped Da lency	ita								CL02	4	3				5	12			
	 Measures of Dispersion Measures of Skewness Chebyshev's Theorem 	and Empiric	al Rule																		
	4. Probability																				
	Probability Definition of some terms Conceptual Approache Mutually Exclusive Event Independent and Depen	s to Probabil s	lity																		
	 Independent and Depen Conditional Probability Intersection of Events and 	dent Events	ion Rule								CL01, CL03	4	2				5	11			
	 Union of Events and Addi Permutation and Combi 	tion Rule	.oac																		
	5.Probability Distribution - The Concept of Probabili	ty Distributio	on																		
	- The Concept of Probabili - Probability Distribution of - Expected Value and Varia - Normal Distribution	of a Discrete ince	Random Varia	able							CL01, CL03	4	2				5	11			
	6. Sampling and Sampling	Distribution									-										
	6. Sampling and Sampling - Population and Sampling - Mean and Standard Deviz - Sampling Distribution of - Central Limit Theorem	Distribution stion of mear Mean	7								CL01, CL03	2	1				3				
	- Central Limit Theorem																_				
	7.Introduction to Estimation - Concepts of Estimation																				
	- Estimation of Mean	te									CL01, CL03	2	2				4	8			
	- Interval Estimation of a P - Interval Estimation of a P	opulation Me	ean: Small Sar	nple																	
	8. Introduction to Hypothe - Concept of Hypothesis To - Types or Errors	esting esting																			
	8. Introduction to Hypothe - Concept of Hypothesis Ti- - Types or Errors - Testing the Population M- - (Z-distribution) - Testing of Population Me - ANOVAs: One-way ANOV	lean: Large Sa an: Small	amples	hutice)							CL01, CL03	4	2				4	10			
	- ANOVAs: One-way ANOV	As, Factorial	ANOVAs and I	un Anovas in	SPSS																
	9. Estimation and Hypothe - Chi-square Distribution - Intervals estimation of a	ois resting A population v	vout Variance ariance	-							CL01, CL03	3	2				3	8			
	- Hypothesis Testing of a p 10. Regression and Correla	opulation va	riance																		
	 Simple linear regression Coefficient of determina 	model tion									CL01, CL03	4	3				5	12			
	- Coefficient of correlation - Using the regression mo											L "	L	<u></u>	L		L ĺ				
		_			_	_	_		_	_	$\vdash =$							0			
																		0			
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		_			_	_	_		_	_	$\vdash \equiv$	\vdash				\vdash		0			
																	Total	92			
				Conti	nuous Asses	sment					Percentage (%)		F2F			NF2F		SLT			
	1	Assignment	nment				10					4		4							
	2	Tests Quiz									20 10		3			5 2		8			
	4										1	1			1			0			
	5 0 7														0						
								1	1			1		Total	0 15						
	Final Assessment 1 Final Examination 2						ln														
							Percentage (%)					NF2F		SLT							
							60 3				10			13							
	3																	0			
	5																	0			
																	Total	13			
	**Please tick (√) if this co	urse is Latih	an Industri/	Clinical Plac	ement/ Prac	ticum/ WBL	using 2-wee	ks, 1 credit fo	ormula							GRANE	TOTAL SLT	120			
	"Indicate the CLO based o	n the CLO's n	umbering in		_ r racucal, C	others, F2I	muer to hac	v.zr=Non	. and to face												
11	Identify special requireme the course (e.g: software, r computer lab, simulation	ent to deliver nursery, room, etc)		_	· <u>-</u>	· <u>-</u>		_	_		_	· <u> </u>	· <u> </u>		_	_	_	_			
12	References (include requir		I	nd should be	the most curr	ent)				Main refere	nces supporti 2016. Introdu	ng the course									
										Additional n - Triola, M. F - Blumen ^	eferences sup ., (2017) Elem G. (2017) Elei	pporting the c entary Statist mentary Statist	ourse ics, 13th editi stics, 10th edi	ion, NA: Pear:	son. ork: McGraw !	4111.					
										Diament A.		y stati	cs, roured								
										Lact	Octob	0				Last revised October 2020					
2.7	Other additional informati	on i																			

Lecturer Schedule

Week	Lecture Schedule	Reference Material
1	Introduction	Chapter 1 (Main Reference)
2	Data Classification	Chapter 2 (Main Reference)
3	Measures of Central Tendency and Dispersion	Chapter 3 (Main Reference)
4	Probability	Chapter 4 (Main Reference)
5&6	Probability Distributions	Chapter 5 & 6 (Main Reference)
7	Sampling and Sampling Distribution	Chapter 7 (Main Reference)
8	Estimation of parameters	Chapter 8 (Main Reference)
9&10	Significance Testing	Chapter 9 & 10 (Main Reference)
11&12	Significance Tests Using The Chi-Square Distribution	Chapter 11 (Main Reference)
13&14	Simple Linear Regression Analysis	Chapter 13 (Main Reference)

Tutorial Schedule

Week	Lecture Schedule	Reference Material
1	Tutorial 1 - Introduction	Chapter 1 (Main Reference)
2	Tutorial 2 - Data Classification	Chapter 2 (Main Reference)
3	Tutorial 3 - Measures of Central Tendency and Dispersion	Chapter 3 (Main Reference)
4	Tutorial 4 - Probability	Chapter 4 (Main Reference)
5 & 6	Tutorial 5 - Probability Distributions	Chapter 5 & 6 (Main Reference)
7	Tutorial 6 - Sampling and Sampling Distribution	Chapter 7 (Main Reference)
8	Tutorial 7 - Estimation of parameters	Chapter 8 (Main Reference)
9 & 10	Tutorial 8 - Significance Testing	Chapter 9 & 10 (Main Reference)
11 & 12	Tutorial 9 - Significance Tests Using The Chi-Square Distribution	Chapter 11 (Main Reference)
13 & 14	Tutorial 10 - Simple Linear Regression Analysis	Chapter 13 (Main Reference)

Continuous Assessment Schedule

Tasks	Percentage (%)	Week
Assignments/ Project	10	5
Tests 1 & 2	20	4 & 6
2 Quizzes	10	2 & 5



Faculty of Engineering, Science & Technology Assignment Cover Sheet

Course Code: <u>EB3125</u>		Course Title: STATISTICS	
Assignment Title: ASSIG	GNMENT 10%_	Due Date: <u>27/11/2020</u>	
Date Submitted:		Lecturer Name: NUR SUAID	OAH ROSLI
any other student's work or fitext, nor has any part been wr	is my individual work. I hat com any other source excep itten for me by another per		xplicitly in the
Student name:	Student ID:	Signature:	
	p assignment and that no pa her source except where du	art of this submission has been copied from a cknowledgement is made explicitly in	•
Student ID	Student Name	Signa	ature
Lecturer's comments:			
Total Marks:		Lecturer's Signature	:
Feedback to Student:			
I/We acknowledged rece	iving feedback from the	he lecturer on this assignment.	
Student's Signature:			
Extension certification:			
This assignment has been	n given an extension a	nd is now due on	
		Lecture	er's Signature:

Submission:

Assignments, with or without disks, must be submitted with the "assignment cover sheet" attached securely to the front.

ASSIGNMENTS NOT SUBMITTED WITH THE COVER SHEET WILL NOT BE MARKED.

Late Penalties:

Assignments that are submitted after the due date and time will attract a penalty of 10% of the total marks available per day late, up to a maximum of five days. Assignments submitted after five days will be graded with zero mark.

Extensions:

Extensions will only be granted in exceptional circumstances on medical or compassionate grounds. Extensions must be applied for in advance of the assignment's due date and the lecturer of the appropriate course must sign the extension certificate on the assignment cover sheet.

Assessment Irregularity:

Cheating and plagiarism, i.e. the action or practice of taking and using as one's own the thoughts, writings or other work of someone else with the intent to deceive, constitute irregularities as described in the programme handbook. Such actions are a major infringement of the university college's academic values and will be dealt with severely.

Plagiarism and/or cheating occurs when:

- * a computer program or part of a program, substantially written by someone else (either another student, a previous student, the author of a publication or some other person) is presented as one's own work;
- * paragraphs, and even sentences in essays which are written by someone else, are not enclosed in quotation marks, and accompanied by full reference to source;
- * the work of someone else is paraphrased, and is not appropriately attributed and referenced.

Group Work:

By signing the cover sheet, group members are indicating that they agree that each member of the group made a fair and reasonable contribution to the assignment or project. In cases of doubt or dispute, individual members of the group may be required to undergo an oral examination regarding their contribution to the assignment or project.

Note:

All marks are provisional until ratified by the exam board at the end of the session

EB 3125 (STATISTICS): PROJECT NEW DRUG DEVELOPMENT DATA

Description of Data: [50 MARKS]

The data consists of drug information collected on 50 patients used to perform frequency and descriptive statistics. Variables in the data set are:

- 1. Subject: Patient
- 2. Treatment: Two levels. 0 for Placebo and 1 for treatment group.
- 3. Age: age of patient
- 4. Gender: Male or Female
- 5. Before exp BP: Blood pressure before experiment
- 6. After_exp_BP: Blood pressure after experiment

Answer all question. Your answer must in the excel file. Label all your answer sheet with the question number.

1. Show the descriptive statistics (Mean, median, standard deviation) for the age, blood pressure before experiment and blood pressure after experiment

(9 marks)

2. Create a scatterplot for this data.

i. x axis = age, y axis = Blood pressure before experiment

(2 marks)

- ii. x axis = age, y axis = Blood pressure after experiment
- (2 marks)
- iii. x axis = Blood pressure before experiment, y axis = Blood pressure after experiment (2 marks)

iv. x axis = Treatment, y axis = Blood pressure before and after experiment (make in one graph. (3 marks)

- 3. Show the least squares regression line on the scatterplot Question no.2. (5 marks)
- 4. Find the regression equation for predicting on Question no.2. (5 marks)
- 5. Find the correlation coefficient for the data obtained from Question no.2 (5 marks)
- 6. Explain the meaning of the correlation coefficient obtained for Question no.5. (8 marks)
- 7. Use Hypothesis testing (t-test in the excel) to see the significant between
 - i. Blood pressure after experiment vs Blood pressure before experiment (3 marks)
 - ii. treatment vs Blood pressure after experiment (3 marks)
 - iii. treatment vs Blood pressure before experiment. (3 marks)

SUBJECT	TREATMENT	AGE	GENDER	BEFORE_EXP_BP	AFTER_EXP_BP
D1	1	65	F	103.3	80.5
D2	1	59	F	93.6	85.9
D3	1	60	М	92	85.2
D4	1	54	F	93	87.8
D5	1	65	F	95.4	85.3
D6	1	57	М	109.6	94.2
D7	1	69	М	97.9	83.9
D8	1	62	М	96	85
D9	1	49	F	98.4	86.3
D10	1	45	F	98.4	90
D11	1	65	F	95.5	85.2
D12	1	62	М	91.7	87.9
D13	1	64	М	98.6	84.6
D14	1	68	F	98	83.8
D15	1	70	M	96.4	85.5
D16	1	66	М	104.4	93
D17	1	65	F	111.7	85.4
D18	1	63	F	108.6	84.8
D19	1	61	F	99.1	82.4
D20	1	63	М	106.8	88.7
D21	1	69	M	111.5	86.5
D22	1	56	М	97.4	82.4
D23	1	58	F	87.5	78
D24	1	46	М	98.1	83.8
D25	1	56	F	98.6	87
D26	1	64	М	99.1	86.3
D27	1	61	F	96.4	87.6
D28	1	66	F	101.2	84.8
C1	0	63	F	97.4	93.1
C2	0	56	F	97.2	92.4
C3	0	54	М	98.8	94.6
C4	0	69	М	98.4	92.3
C5	0	75	М	89.8	89.3
C6	0	62	F	103.4	99.7
C 7	0	61	F	90.1	88.4
C8	0	59	М	93.7	90.4
C9	0	73	F	96.4	91.1
C10	0	57	F	98.6	90.5
C11	0	48	М	95.2	90.4
C12	0	64	М	95	89.3
C13	0	61	F	97.4	93.8
C14	0	66	F	97.4	92.6
C15	0	57	М	101.6	96.9
C16	0	65	М	101.2	98.9

C17	0	63	М	97.5	89.9
A18	0	51	F	92.2	86.2
A19	0	68	М	96.6	92.6
A20	0	65	F	96.9	90.4
A21	0	65	F	102.6	91.5
A22	0	64	М	99.5	93.8

Warning of plagiarism, syndication and cheating

Warning: Cheating

Cheating, in any form, is a very serious offence which could lead to severe disciplinary action. Cheating includes:

- using unauthorised materials in tests and examinations;
- letting another person take tests or examinations on one's behalf OR taking tests or examinations on another person's behalf;
- working jointly, copying or sharing another student's work and presenting it as one's own piece of work;
- inventing, copying or altering data, quotations or references;
- plagiarising, i.e. taking or using another person's work without attributing the source and thus, giving the impression that it is one's own work.

Penalties for Cheating in Tests or Examination

Any student caught and found guilty in the disciplinary hearing will be deemed to have **FAILED in** the subject and will be required to **REPEAT** the said subject. Any repeated offence may result in **EXPULSION FROM THE UNIVERSITY**.

IMPORTANT POINTS TO NOTE

ATTENDANCE

As students, you will benefit by attending classes regularly. Full attendance is required and the University has the right to bar any student from taking the final examinations for poor class attendance (below 75%). If you are barred, you will not be allowed to take the examination and will have to repeat the level in the subsequent semester.