TEACHING PLAN

FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI

UNIVERSITI TEKNIKAL MALAYSIA MELAKA

LINEAR ALGEBRA AND DISCRETE MATHEMATICS

BITI1213	SEMESTER 1	SESSION 2023/2024

1.0 DESCRIPTION

LO	DESCRIPTION	PROGRAMME
LO01	Apply the basic concepts and application of related Linear Algebra topics. (C3)	BITC,BITD,BITE,BITI,BITM,BITS,BITZ
LO02	Apply the basic concepts and application of related Discrete Mathematics topics. (C3)	BITC,BITD,BITE,BITI,BITM,BITS,BITZ
LO03	React to the problems based on the concept and the theories that have been learned.(P3)	BITC,BITD,BITE,BITI,BITM,BITS,BITZ

2.0 SYNOPSIS

THIS COURSE COVERS SELECTED TOPICS FROM TWO DISCIPLINES OF MATHEMATICS NAMELY LINEAR ALGEBRA AND DISCRETE MATHEMATICS THAT ARE IMPORTANT FOR COMPUTER SCIENCE STUDENTS. TOPICS FOR LINEAR ALGEBRA INCLUDE MATRICES, LINEAR EQUATIONS, VECTORS, EIGENVALUES AND LINEAR TRANSFORMATION. TOPICS FOR DISCRETE MATHEMATICS COVERS INTRODUCTION TO LOGICS, INTEGERS AND ALGORITHMS, MATHEMATICAL REASONING, COMBINATORICS, RELATIONS, GRAPHS AND TREES.

3.0 PRE-REQUISITE

PRE-REQUISITE	SUBJECT NAME	COHORT	PROGRAMME

4.0 MAIN TEXT BOOK

[1] UTEM ULEARN PLATFORM (BITI 1213 – LINEAR ALGEBRA AND DISCRETE MATHEMATICS) HTTPS://ULEARN-ICTM.UTEM.EDU.MY /SEM1202324 [2] JIM HEFFERON (2020). LINEAR ALGEBRA, 4TH EDITION (HTTP://JOSHUA.SMCVT.EDU/LINEARALGEBRA) ISBN: 9781944325114 [3] SEYMOUR LIPSCHUTZ, MARC LARS LIPSON (2018), SCHAUM`S OUTLINE OF LINEAR ALGEBRA, 6TH EDITION, MCGRAW-HILL EDUCATION) ISBN: 9781260011449 HTTPS://WWW.ACCESSENGINEERINGLIBRARY.COM/CONTENT/BOOK/9781260011449 [4] BERNAD KOLMAN, DAVID R. HILL (2008). ELEMENTARY LINEAR ALGEBRA WITH APPLICATIONS. 9TH EDITION. PEARSON PRENTICE HALL. ISBN: 0131350633 [5] OSCAR LEVIN (2020) DISCRETE MATHEMATICS: AN OPEN INTRODUCTION, 3RD EDITION. (HTTP://DISCRETE.OPENMATHBOOKS.ORG) ISBN: 1792901690 [6] KENNETH H. ROSEN (2013). DISCRETE MATHEMATICS AND ITS APPLICATIONS, 7TH EDITION. MCGRAW-HILL EDUCATION. ISBN: 9789814670135

5.0 REFERENCES

[1] UTEM ULEARN PLATFORM (BITI 1213 – LINEAR ALGEBRA AND DISCRETE MATHEMATICS) HTTPS://ULEARN-ICTM.UTEM.EDU.MY /SEM1202324 [2] JIM HEFFERON (2020). LINEAR ALGEBRA, 4TH EDITION (HTTP://JOSHUA.SMCVT.EDU/LINEARALGEBRA) ISBN: 9781944325114 [3] SEYMOUR LIPSCHUTZ, MARC LARS LIPSON (2018), SCHAUM`S OUTLINE OF LINEAR ALGEBRA, 6TH EDITION, MCGRAW-HILL EDUCATION) ISBN: 9781260011449 HTTPS://WWW.ACCESSENGINEERINGLIBRARY.COM/CONTENT/BOOK/9781260011449 [4] BERNAD KOLMAN, DAVID R. HILL (2008). ELEMENTARY LINEAR ALGEBRA WITH APPLICATIONS. 9TH EDITION. PEARSON PRENTICE HALL. ISBN: 0131350633 [5] OSCAR LEVIN (2020) DISCRETE MATHEMATICS: AN OPEN INTRODUCTION, 3RD EDITION. (HTTP://DISCRETE.OPENMATHBOOKS.ORG) ISBN: 1792901690 [6] KENNETH H. ROSEN (2013). DISCRETE MATHEMATICS AND ITS APPLICATIONS, 7TH EDITION. MCGRAW-HILL EDUCATION. ISBN: 9789814670135

6.0 LEARNING ACTIVITIES AND STUDENT LEARNING TIME (SLT)

Kredit : 3

INDENPENDANT LEARNING	**L**	**LECUTURER**	*** 0.5 to 1 hour for each 1 hour of Lecturer**	**I**	0.5
	T	**TOTURIAL**	*** 0.5 to 1 hour for each 1 hour of Tutorial**	**II**	0.5
	P	**PRACTICAL**	*** 0.5 to 1 hour for each 1 hour of Practical**	**III**	0.5

		GUIDED LEARNING TIME(HR)				**INDEPENEDANT LEARNING(HR)**								**ASSESSMENT TIME(HR)**				
WEEK	**CLO**	**L**	**T**	**P**	**O**	**L**	**T**	**P**	**O**	**F**	**T**	**A**	**O**	**F**	**T**	**A**	**O**	**SLT**
W1	LO1	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W2	LO1	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W3	LO1	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W4	LO3	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W5	LO1	2	2	0	0	1	1	0	0	0	1	0	0	0	0.25	0	0	7.25
W6	LO1	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W7	LO3	2	0	2	0	1	0	1	0	0	0	6	0	0	0	1.5	0	13.5
W8		0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
W9	LO2	2	2	0	0	1	1	0	0	8	0	0	0	2	0	0	0	16
W10	LO3	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W11	LO2	2	2	0	0	1	1	0	0	0	1	0	0	0	0.25	0	0	7.25
W12	LO2	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W13	LO2	2	2	0	0	1	1	0	0	0	0	0	0	0	0	0	0	6
W14	LO3	2	2	0	0	1	1	0	0	0	0	6	0	0	0	1.5	0	13.5
W15	LO2	2	2	0	0	1	1	0	0	8	0	0	0	2	0	0	0	16
Keseluruhan		28	26	2	0	14	13	1	0	16	2	12	0	4	0.5	3	0	121.5

SLT Credit Equivalent 3.04

7.0 SUBJECT ASSESSMENTS

NO	**LEARNING OUTCOME**	**PROGRAMME OUTCOME**	**ASSESSMENT METHOD**	**MARK CODE**	**PERCENTAGE (%)**
1	1	1	MID TERM- ok	MT-1	30
2	2	1	PEPERIKSAAN AKHIR- ok	PA-1	30
3	3	6	ASSIGNMENT 1- ok	TG1-1	15
4	3	6	ASSIGNMENT 2- ok	TG2-2	15
5	1	1	TEST 1- ok	UJ1-1	5
6	2	1	TEST 2- ok	UJ2-2	5
TOTAL					**100**

8.0 **WEEKLY LECTURE PLAN**

Week	Session	Contents	References	Delivery Method & LO
W1 (09/10/2023 – 13/10/2023)	**Lecture 1** **Tutorial 1**	**Matrices and Linear Equations** **Lecture content** • Matrices and its types • Properties of Matrix Operations • Matrix Multiplication • Elementary Row Operations • The Inverse of a Matrix **Tutorial content** • Example and exercise on the topics covered in Lecture 1	[1, 2, 3, 4] [1]	Lecture & Tutorial LO 1
W2 (16/10/2023 – 20/10/2023)	**Lecture 2** **Tutorial 2**	**Determinants** **Lecture content** • Properties of determinants • Calculating an inverse of matrix by cofactor expansion • Calculating an inverse of matrix by row reductions **Tutorial content** • Example and exercise on the topics covered in Lecture 2	[1, 2, 3, 4] [1]	Lecture & Tutorial LO 1
W3 (23/10/2023 – 27/10/2023)	**Lecture 3** **Tutorial 3**	**Linear Equations** **Lecture content** • Introduction to linear equation and linear systems • Cramer's rule • Gaussian elimination • Gauss Jordon reduction • Inverse of a matrix **Tutorial content** • Example and exercise on the topics covered in Lecture 3	[1, 2, 3, 4] [1]	Lecture & Tutorial LO 1 **Online Test 1** **(5%)**
W4 (30/10/2023 – 03/11/2022)	**Lecture 4** **Tutorial 4**	**Application of Linear System** **Lecture content** • Introduction to application of linear equation and linear systems **Tutorial content** • Example and exercise on the topics covered in Lecture 4	[1, 2, 3, 4] [1]	Lecture & Tutorial LO 3
W5 (06/11/2023 – 10/11/2022)	**Lecture 5** **Tutorial 5**	**Vectors** **Lecture content** • Introduction to vectors – R^2 and R^3 • Dot and cross product • Application of vectors (linear transformation, area and volume) **Tutorialcontent**	[1, 2, 3, 4]	Lecture & Tutorial LO 1

		• Example and exercise on the topics covered in Lecture 5	[1]	
W6 (13/11/2023 - 17/11/2023) *12/11 (Sun) – Deepavali (Public Holiday)	**Lecture 6** **Tutorial 6**	**Eigenvalues and Linear Transformation** **Lecture content** • Eigenvalues and eigenvectors • Diagonalization of symmetric matrices • General linear transformation **Tutorialcontent** • Example and exercise on the topics covered in Lecture 6	[1, 2, 3, 4] [1]	Lecture & Tutorial LO 1
W7 (20/11/2023 – 24/11/2023)	**Lecture 7** **Tutorial 7**	**Introduction to Matlab** **Lecture content** • Introduction to Matlab. • Matrix operations in Matlab • Elementary row operation in Matlab • Vectors in Matlab • Linear transformation in Matlab **Tutorial content** • Example and exercise on the topics covered in Lecture 7	[1] [1]	Lecture & Tutorial LO 3 **Assignment 1**
W8 (27/11/2023 - 01/12/2023)		**MID SEMESTER BREAK**		
W9 (04/12/2023 – 08/12/2023)	**Lecture 8** **Tutorial 8**	**Introduction to Logic** **Lecture content** • Logic • Proposition equivalences • Predicate and quantifiers • Nested and quantifiers • Rules of inference • Introduction to proof **Tutorial content** • Example and exercise on the topics covered in Lecture 8	[1, 5, 6] [1]	Lecture & Tutorial LO 2 ***MID TERM Exam**
W10 (11/12/2023 – 15/12/2023)	**Lecture 9** **Tutorial 9**	**Integers and Algorithms** **Lecture content** • The integers and division. • Integers and algorithm. **Tutorial content** • Example and exercise on the topics covered in Lecture 9	[1, 5, 6] [1]	Lecture & Tutorial LO 3
W11 (18/12/2023 – 22/12/2023)	**Lecture 10** **Tutorial 10**	**Induction and Recursion** **Lecture content** • Mathematical induction • Recursive definition	[1, 5, 6]	Lecture & Tutorial LO 2

		Tutorial content • Example and exercise on the topics covered in Lecture 10	[1]	**Online Test 2** **(5%)**
W12 (25/12/2023 – 29/12/2023) *25/12 – Christmas Day (Public Holiday)	**Lecture 11** **Tutorial 11**	**Combinatorics** **Lecture content** • The basics of counting • The pigeonhole principles • Permutations and combinations **Tutorial content** • Example and exercise on the topics covered in Lecture 11	[1, 5, 6] [1]	Lecture & Tutorial LO 2
W13 (01/01/2024 – 05/01/2024) *01/01 – New Year Day (Public Holiday)	**Lecture 12** **Tutorial 12**	**Relations** **Lecture content** • Relations and their properties • n-ary relations and their applications • Representing relations • Closures of relations **Tutorial content** • Example and exercise on the topics covered in Lecture 12	[1, 5, 6] [1]	Lecture & Tutorial LO 2
W14 (08/01/2024 – 12/01/2024)	**Lecture 13** **Tutorial 13**	**Graphs** **Lecture content** • Introduction to graph • Representing graphs • Connectivity • Shortest path problems: Djikstra's Algorithm **Tutorial content** • Example and exercise on the topics covered in Lecture 13	[1, 5, 6] [1]	Lecture & Tutorial LO 2 **Assignment 2**
W15 (15/01/2024 – 19/01/2024)	**Lecture 14** **Tutorial 14**	**Trees** **Lecture content** • Introduction to trees • Application of trees • Trees Traversal and Sorting **Tutorial content** • Example and exercise on the topics covered in Lecture 14	[1, 5, 6] [1]	Lecture & Tutorial LO 2
W16 (22/01/2024 - 26/01/2024)		**REVISION WEEK (5 DAYS)**		
W17 – W18 (29/01/2024 - 09/02/2024)		**FINAL EXAM WEEK**		**Final** **Exam**

9.0 CQI

PROGRAMME	SESSION (B4)	SUGGESTION OF IMPROVEMENTS	SESSION	ACTION TO BE TAKEN
BITE	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENTS STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THAT THEY HAVE INORDER TO UNDERSTAND.
BITD	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENTS STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THAT THEY HAVE INORDER TO UNDERSTAND.
BITZ	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENT'S STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THAT THEY HAVE INORDER TO UNDERSTAND.
BITS	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENT'S STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THEY HAVE TO UNDERSTAND.
BITM	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENT'S STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THAT THEY HAVE INORDER TO UNDERSTAND.
BITI	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENT'S STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THEY HAVE TO UNDERSTAND.
BITC	1-2022/2023	THE ASSESSMENT CATEGORY IS MAINTAINED. ALL LECTURERS IN CHARGE OF DEDICATED PROGRAMMES NEED TO IDENTIFY THE STUDENTS STRENGTHS AND WEAKNESSES THROUGH RANDOM QUESTIONS GIVEN BASED ON PREVIOUS TOPICS BEFORE STARTING NEW TOPICS.	1-2023/2024	LECTURER NEED TO IDENTIFY WEAK STUDENTS AND THE PROBLEMS THAT THEY HAVE INORDER TO UNDERSTAND.

10.0 STAFF DETAILS

STAFF NO.	NAME	DEPARTMENT	PHONE NO.	EMAIL
00021	TS. AHMAD FADZLI NIZAM BIN ABDUL RAHMAN	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)	06-3316607	fadzli@utem.edu.my
00071	TS. DR. NORZIHANI BINTI YUSOF	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)	06-3316538	norzihani@utem.edu.my
00648	PROFESOR MADYA GS. DR. ASMALA BIN AHMAD	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)	06-331 6602	asmala@utem.edu.my
01184	TS. DR. MOHD RIZUAN BIN BAHARON	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)	06-331 6668	mohd.rizuan@utem.edu.my
01307	DR. YOGAN A/L JAYA KUMAR	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)	+6062702441	yogan@utem.edu.my
01776	DR. NORHAZWANI BINTI MD YUNOS	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)	06-3316706	wanie.my@utem.edu.my
02638	TS. DR. WAN MOHD YA'AKOB BIN WAN BEJURI	FAKULTI TEKNOLOGI MAKLUMAT DAN KOMUNIKASI (FTMK)		yaakob@utem.edu.my

TEACHING PLAN APPROVAL (UNTIL END OF WEEK 2)

Comment (Optional) :		Comment (Optional) :	
Prepared By,		**Approved By,**	
Name :	TS. AHMAD FADZLI NIZAM BIN ABDUL RAHMAN	Name :	DR. FAUZIAH BINTI KASMIN
Position :	PENSYARAH KANAN	Position :	KETUA JABATAN
Date :	09/10/2023	Date :	

TEACHING PLAN IMPLEMENTATION (FROM WEEK 3 TO WEEK 16)

Comment (Optional) :		Comment (Optional) :	
Prepared By,		**Checked By,**	
Name :		Name :	
Position :		Position :	
Date :		Date :	

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