Teaching Plan

FAKULTI TEKNOLOGI MAKLUMAT & KOMUNIKASI
UNIVERSITI TEKNIKAL MALAYSIA MELAKA

ARTIFICIAL INTELLIGENCE

BITI 1113	SEMESTER 2	SESSION 2022/2023

BITI 1113 ARTIFICIAL INTELLIGENCE (3, 2, 2)
TYPE OF COURSE: P
EDITION: 3
UPDATED: 25-2-2023

1.0 LEARNING OUTCOMES

Upon completion of this subject, the student should be able to:

CLO1: Explain the concept of Artificial Intelligence and its techniques. (C4, PLO1, LODC1)
CLO2: Classify the types of Artificial Intelligence techniques. (P1, PLO2, LODC3A)
CLO3: Choose the suitable Artificial Intelligence techniques in problem solving. (A3, PLO6, LODC3C)

2.0 SYNOPSIS

Students are exposed to the basic and branches of Artificial Intelligence such as the various search techniques, knowledge representation and reasoning, inference techniques, learning from experience and planning. Besides, some applications of AI including game playing, expert systems, and machine learning will be introduced.

3.0 PRE-REQUISITE

None

4.0 PRACTICAL

Tutorial/practical and some AI tools will be used in the practical sessions.

5.0 REFERENCES

[1] Russel, S & Norvig, P. (2020). Artificial Intelligence: A Modern Approach, 4th Edition, Prentice Hall.

[2] Luger, G. F. (2015). Artificial Intelligence: Structures and Strategies for Complex Problem Solving, 5th Edition, Pearson Education.

[3] Negnevitsky, M., (2011), Artificial Intelligence: A Guide to Intelligent System, 3rd Edition, Addison Wesley.

[4] Kopec, D, Shetty, S & Pileggi, C (2014), Artificial Intelligence Problems and Their Solutions (Computer Science), T Mercury Learning & Information.

[5] https://software.intel.com/en-us/ai-academy/students/kits/ai-501

6.0 COURSE IMPLEMENTATION

i. Lecture: 2 hours per week for 14 weeks (Total = 28 hours)
ii. Lab: 2 hours per week for 14 weeks (Total = 28 hours)

7.0 COURSE EVALUATION

Assessment Method	**CLO 1 (C4, PLO1, LODC1)**	**CLO 2 (P1, PLO2, LODC3A)**	**CLO 3 (A3, PLO6, LODC3C)**	**Scheme, Rubric / guideline**
Tutorial Exercises (2): 10%		T1 (5%) T2 (5%)		T1_A.doc T2_A.doc
Lab Assessment (1): 10%		LA1 (10%)		LA1_R.doc
Assignment (1): 10%			A1 (10%)	A1_R.doc
Mid-term Test (1): 20%	MT1 (20%)			MT1_A.doc
Project (1): 20%			P1 (20%)	P1_G.doc P1_R.doc
Final Exam (1): 30%	F1 (30%)			F1_A.doc
Total:	50%	20%	30%	

8.0 STUDENT LEARNING TIME (SLT)

		Guided Learning Time				Independant Learning								Assessment Time				
Week	**CLO**	**L**	**T**	**P**	**O**	**L**	**T**	**P**	**O**	**F**	**T**	**A**	**O**	**F**	**T**	**A**	**O**	**SLT**
W1	1	2		2		2	0	1		0	0	0	0					7
W2	1	2		2		2	0	1		0	0	0	0					7
W3	3	2		2		2	0	1		0	0	0	0					7
W4	1	2		2		2	0	1		0	0	0	0					7
W5	3	2		2		2	0	1		0	0	0	1				0.25	8.25
W6	1	2		2		2	0	1		0	0	0	0					7
W7	2	2		2		2	0	1		0	0	0	2				0.5	9.5
W8	1	2		2		2	0	1		0	4	0	0		1			12
W9	3	2		2		2	0	1		0	0	0	0					7
W10	2	2		2		2	0	1		0	0	0	1				0.25	8.25
W11	1	2		2		2	0	1		0	0	0	0					7
W12	2	2		2		2	0	1		0	0	0	0					7
W13	1	2		2		2	0	1		0	0	0	0					7
W14	3	2		2		2	0	1		0	0	0	2				0.5	9.5
>W14										8	0	0	0	2				10
Overall		28	0	28	0	28	0	14	0	8	4	0	6	2	1	0	1.5	120.5
															SLT Credit Equivalent			3.0125

9.0 DETAILED SYLLABUS AND TEACHING PLAN

Week	Sessions	Contents	References	Delivery Method
1 (20 Mar-26 Mar)	Lecture 1 Lab 1	**INTRO TO AI** ▪ What is Artificial Intelligence? ▪ AI History, Alan Turing and the 1950s ▪ AI Techniques, Fields & Applications **Tutorial on Intro to AI**	[1][3] Tutorial Materials	Lecture Tutorial
2 (27 Mar – 2 Apr)	Lecture 2 Lab 2	**UNINFORMED SEARCH TECHNIQUES I** ▪ Introduction ▪ State Space Concepts ▪ Search Performance Criteria ▪ Breadth-First Search ▪ Uniform-Cost Search **Tutorial on Uninformed Search I**	[1][3] Tutorial Materials	Lecture Tutorial
3 (3 Apr – 9 Apr)	Lecture 3 Lab 3	**UNINFORMED SEARCH TECHNIQUES II** ▪ Depth-First Search ▪ Depth-Limited Search ▪ Iterative Deepening Depth-First Search ▪ Bidirectional Search **Tutorial on Uninformed Search II**	[1] Tutorial Materials	Lecture Tutorial
4 (10 Apr – 16 Apr)	Lecture 4 Lab 4	**INFORMED SEARCH TECHNIQUES I** ▪ Using Heuristics for Search ▪ Greedy Best-First Search ▪ A* Search ▪ Beam and IDA* Search **Tutorial on Informed Search I**	[1] Tutorial Materials	Lecture Tutorial
5 (17 Apr – 23 Apr)	Lecture 5 Lab 5	**INFORMED SEARCH TECHNIQUES II** ▪ Local Search Concepts ▪ Hill Climbing Search ▪ Local Beam Search ▪ Identifying Optimal Paths **Tutorial on Informed Search II**	[1][3] Tutorial Materials	Lecture **ASSESSED TUTORIAL 1 (individual)** Tutorial
6 (24 Apr -30 Apr)	**MID-SEM BREAK**			
7 (1 May – 7 May)	Lecture 6 Lab 6	**GAME PLAYING** ▪ Adversarial Search Concepts ▪ Game Trees ▪ Minimax ▪ Alpha-Beta Pruning ▪ Sample Application **Tutorial on Minimax & Alpha-Beta pruning**	[1] Tutorial Materials	Lecture **PROVIDE ASSIGNMENT** Tutorial

8
(8 May – 14 May)
	Lecture 7
	
	Lab 7
		EXPERT SYSTEM LIFECYCLE I
		▪ Overview of Expert System Lifecycle
		▪ Knowledge Acquisition Phase
		▪ Knowledge Representation Phase:
		  ▪ Semantic Nets
		  ▪ Rules
		  ▪ Frames
		Tutorial on Rules Based Expert System 1
			[1][3]
			
			Tutorial Materials
				Lecture
				
				MID-TERM TEST
				(W1-W5)
				
				Tutorial

9 (15 May – 21 May)	Lecture 8 Lab 8	**EXPERT SYSTEM LIFECYCLE II** ▪ Knowledge Implementation Phase ▪ Rules for Knowledge Representation ▪ Rule Based Systems ▪ Rule Based Expert System ▪ Forward & Backward Chaining in Rule-Based Expert System ▪ Verification & Validation Phase **Tutorial on Rules Based Expert System II**	[1][3] Tutorial Materials	Lecture **ASSIGNMENT SUBMISSION** Tutorial
10 (22 May – 28 May)	Lecture 9 Lab 9	**MACHINE LEARNING I** ▪ Introduction ▪ Learning Concepts ▪ Supervised Learning & Unsupervised Learning **Tutorial on Machine Learning**	[1][2][3] Tutorial Materials	Lecture **PROVIDE PROJECT** Tutorial
11 (29 May – 4 Jun)	Lecture 10 Lab 10	**MACHINE LEARNING II** ▪ Decision Tree Induction **Tutorial on Decision Tree**	[1] [2] Tutorial Materials	Lecture **LAB ASSESSMENT** Tutorial Materials
12 (5 Jun – 11 Jun)	Lecture 11 Lab 11	**MACHINE LEARNING III** ▪ Biological Inspiration & Neurons ▪ Perceptron ▪ Multi-Layer Artificial Neural Network (ANN) **Tutorial on Neural Network**	[1] [2] Tutorial Materials	Lecture Tutorial Materials
13 (12 Jun – 18 Jun)	Lecture 12 Lab 12	**MACHINE LEARNING IV** ▪ Multi-Layer Artificial Neural Network (ANN) **Tutorial on Neural Network**	[1] [2] Tutorial Materials	Lecture **ASSESSED TUTORIAL 2 (individual)** Tutorial Materials

14 (19 Jun - 25 Jun) ONLINE	Lecture 13 Lab 13	**INTELLIGENT AGENTS** ▪ Introduction to Agents ▪ Properties of Agents ▪ Classification of Agents **Tutorial on Intelligent Agent**	[1][3] Tutorial Materials	Lecture Tutorial
15 (26 Jun – 30 Jun) ONLINE	Lecture 14 Lab 14	**AI APPLICATIONS** ▪ Computer Games ▪ Expert Systems ▪ Social Media, Sentiment Analysis ▪ Robotics, etc. ▪ Issues and Challenges **Project Presentation**	[1][2][4] Project Guidelines	Lecture & Lab **PROJECT SUBMISSION** Presentation
16 (1/7/2023-9/7/2023)		**REVISION WEEK**		
17-19 (10/7/2023-27/7/2023)		**FINAL EXAM WEEK**		

10.0 MATRIX OF LEARNING OUTCOMES

SUBJECT vs PROGRAM OUTCOME (PO)

Subject	PROGRAM OUTCOME (PO) - DEGREE								
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9
BITI 1113	X	X				X			

LEARNING OUTCOME (LO) vs PROGRAM OUTCOME (PO)

LO	PROGRAM OUTCOME (PO) - DEGREE								
LO1	X								
LO2		X							
LO3						X			

LEARNING OUTCOME (LO)

LO1	Explain the concept of Artificial Intelligence and its techniques. (C4, PLO1, LODC1)
LO2	Classify the types of Artificial Intelligence techniques. (P1, PLO2, LODC3A)
LO3	Choose the suitable Artificial Intelligence techniques in problem solving. (A3, PLO6, LODC3C)

TEACHING PLAN APPROVAL

Prepared by:

……
Name:

Stamp:

Date: _____

Approved by:

……
Dean/Deputy Dean (Academic)/HOD

Stamp:

Date: _____

TEACHING PLAN IMPLEMENTATION (MID SEMESTER BREAK)

Comment:

Checked by:

……..
Dean/Deputy Dean (Academic)/HOD

Stamp:

Date: _____

TEACHING PLAN IMPLEMENTATION (WEEK 16)

Comment:

Checked by:

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Dean/Deputy Dean (Academic)/HOD

Stamp:

Date: _____