SUKKUR IBA UNIVERSITY

Department of Computer Science

Artificial Intelligence (CSC-350)

Programs & Class: BS-VI (CS & SE)	**Semester:** Fall 2023
Credit Hours: 3+1	**Instructor:** Dr Muhammad Ismail Mangrio
Pre-requisite Courses:	**Post-requisite Courses:**
Co-requisite Courses: None	**e-mail: ismail@iba-suk.edu.pk**
Office Hours: 9:00 AM to 5:00 PM	**Consulting Hours:** **Wednesdays 10:00 AM to 02:00 PM** **Thursdays 09:00 AM to 11:00 AM**
Office Location: Cubical #01, Room#15, Academic Block-I	

EVALUATION

1.	Mid Term Exam	**30%**
2.	Sessional	**20%**
3.	Final Term Exam	**50%**

RECOMMENDED BOOKS:

S. No	Book Name	Author/s Name	Publisher Name & Edition
1.	Artificial Intelligence, A Modern Approach	Stuart Russel, Peter Norvig	Third Edition

REFERENCE BOOKS:

1.	AI algorithms, data structures, and idioms in Prolog, Lisp, and Java	George F. Lugger and William A. Stubblefield	Sixth Edition
2.	The Elements of Statistical Learning Data Mining, Inference, and Prediction	Trevor Hastie, Robert Tibshirani, Jerome Friedman	Second Edition

DIGITAL & WEB RESOURCES:

1. **https://cloud.google.com/learn/what-is-artificial-intelligence**
2. **https://www.britannica.com/technology/artificial-intelligence**
3. **https://www.bbc.co.uk/news/technology-33978561**

4. https://www.bbc.co.uk/teach/ai-15-key-moments-in-the-story-of-artificial-intelligence/zh77cqt

Bried Description of the Course:

This course begins with a motivational section on the foundations of AI and philosophical/ethical considerations. It then focuses on the foundational issue of search (finding solutions to problems). The key concept of knowledge representation is introduced, followed by a variety of representational techniques including logic and fuzzy logic. Machine learning follows this. The course ends with brief discussions about recent trends in AI and applications of various AI algorithms in real-world.

Detailed Course Outline:

Week No.	Topic Name	Assign/Quizzes	Chapter No.
Week No. 1	AI Introduction • Course Introduction • What Is AI? • The Foundations of Artificial Intelligence • The History of Artificial Intelligence • The State of the Art • Risks and Benefits of AI		Chapter No. 1 [Book1]
Week No. 2	• Agents and Environments • Good Behavior: The Concept of Rationality • The Nature of Environments • The Structure of Agents	Quiz 1	Chapter No. 2 [Book1]
Week No. 3	Problem Solving by Searching • Problem-Solving Agents • Example Problems • Search Algorithms • Uninformed Search Strategies • Informed (Heuristic) Search Strategies		Chapter No. 3 [Book1]
Week No. 4	• Local searching • Hill Climbing and its variants • Genetic algorithms		Chapter No. 4 [Book1]
Week No. 5	• Adversarial Search • Game-playing • Min-max algorithm, • Alpha beta pruning	Quiz 2	Chapter No. 5 [Book1]

Week No. 6	Reasoning and Knowledge Representation • Introduction to Reasoning and Knowledge Representation, • Knowledge-Based Agents • Logic • Propositional Logic: A Very Simple Logic • Propositional Theorem Proving • Agents Based on Propositional Logic		Chapter No. 7 [Book1]
Week No. 7 & 8	• First Order Logic • Representation Revisited • Using First-Order Logic • Knowledge Engineering in First-Order Logic	Quiz 3	Chapter No. 8 [Book1]
Week No. 9 & 10	**MID TERM EXAMINATION**		
Week No. 11	Uncertainty Handling • Quantifying Uncertainty in AI • Probabilistic reasoning in AI • Basic Probability Notation		Chapter No. 12, 13 [Book1]
Week No. 12	• Fuzzy Logic in AI • Architecture of Fuzzy Inference System • Membership functions • Examples of of Fuzzy systems • Application areas of fuzzy systems	Quiz 4	
Week No.13	Machine Learning • Forms of Learning • Unsupervised Learning • Supervised Learning		
Week No. 14	• Reinforcement Learning • Applications of Reinforcement Learning	Quiz 5	Chapter No. 22 [Book1]
Week No. 15	Recent trends in AI and applications of AI algorithms • The limitations of AI • AI and ethics • The recent trends and future of AI • Analysis of AI Systems		Chapter No. 27 and 28 [Book1]

Week No. 16	Revision/Presentations/submissions of projects	Presentation	
Week No. 17 & 18	**FINAL TERM EXAMINATION**		

Course Learning Outcomes

S. No.	Course Learning Outcomes (CLOs)
1	Write simple programs to solve problems using an AI technique discussed in the course. *(Apply)*
2	An understanding of the search techniques discussed in this course. *(understand)*
3	Describe the importance of knowledge representation and logic in Artificial Intelligence systems. *(Remember)*
4	Apply machine learning algorithms to data and interpret the results. *(Analyze)*
5	Explain the function and use of fuzzy logic. *(Understand)*

CLO-SO Mapping

	SO IDs												
CLO ID	GA1	GA2	GA3	GA4	GA4	GA5	GA6	GA7	GA8	GA9	GA10	GA11	GA12
1	1	1	0	0	0	1	0	0	0	0	0	0	0
2	1	0	0	0	0	0	0	0	0	0	0	0	0
3	1	1	0	0	0	0	0	0	0	0	0	0	0
4	1	1	0	1	0	1	0	0	0	0	0	0	0
5	1	0	0	0	0	0	0	0	0	0	0	0	0

Approvals

Prepared by	Approved by	Last Updated
Dr Muhammad Ismail Mangrio	Not Specified	04 August 2023