NATIONAL UNIVERSITY
of Computer & Emerging Sciences, Lahore

Department of Computer Science

AL-2002 – Artificial Intelligence Lab

Spring 2026

Instructor Name: Hira Tayyab
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Office Location/Number: No office, email will be active
Office Hours: 24/7

TA Name (if any): TBD
TA Email address: TBD

Lab Information

Program: BS
Type: Core
Lab Meeting Time: Tuesday (BCSC) & Wednesday (BCSE) 8.30am

Credit Hours: 1
Pre-requisites (if any): DS
Lab Venue: Lab 14

Tentative Lecture Plan

Week	Topics
1	Introduction to Python and Jupyter Notebook Variables, data types, basic I/O, loops, conditional statements and functions
2	Data types (List, Tuple, Dictionary, Sets)
3	Introduction to Numpy, Pandas & Matplotlib/Seaborn
4	Basic Search Algorithms (BFS, DFS, UCS, IDS)
5	Basic Search Algorithms (Greedy BFS, A*) Minimax algorithm for a two player game with pruning
6	Minimax algorithm for a two player game without pruning Hill climbing algorithm
7	Midterm Exam
8	Genetic Algorithm
9	Data Wrangling and Visualization ● Handling Missing/Duplicate Values ● Normalization/Standardization ● Charts and Graphs using matplotlib and seaborn ● Feature/label Encoding

10	Machine Learning ● Introduction to scikit-learn to implement basic supervised learning algorithms for regression and classification after applying suitable preprocessing techniques along with basic model evaluation
11	Machine Learning (from scratch/using sklearn, keras) etc. ● Implement a given NN architecture from scratch and test its performance for classification ● Introduction to tensorflow to implement a simple MLP architecture and test its performance on a given dataset
12	Clustering (built in & partial from scratch implementation) ● k-means ● k-mediods
13	Model Evaluation (built in & from scratch) ● Regression (MSE,MAE,R2) ● Classification (Confusion matrix, Accuracy, Precision, Recall, F1 Score, AUC-ROC) etc.
14	● Understanding of Overfitting/underfitting using learning curves ● kfold cross validation ● early stopping, dropout, hyperparameter tuning
15	Convolutional Neural Network (using tensorflow/keras)
16	Final Exam

(Tentative) Grading Criteria

1.	Labs	20-25
2.	Quizzes	5-10
3.	Midterm	25
4.	Final	45

Grading Scheme: Absolute

Lab Policies

1. Quizzes may be un-announced.
2. No makeup for missed quiz or assignment.
3. At least 80% attendance is mandatory.
4. Minimum requirement to pass this lab is to obtain at least 50% marks.
5. Plagiarism in any work from any source will result in zero marks.

Academic Integrity

- Plagiarism and Cheating against academic integrity. Both parties involved in such cases will face strict penalty (negative marking, F grade, DC)
- CODE/ SHARING is strictly prohibited.
- Keep in mind that by sharing your code you are not helping anyone rather hindering the learning process or the other person.
- No excuse will be entertained if your work is stolen or lost. To avoid such incidents
    - Keep backup of your code on safe online storage, such as Google Drive, Dropbox or One drive.
    - Do not leave your work on university lab computer, transfer your work to online storage and delete from the university lab computer (empty recycle bin as well)