# Jordan University of Science and Technology
## Faculty of Computer & Information Technology
## Artifcial Intelligence Department

| AI249 Machine Learning Lab |
|---|
| First Semester 2024-2025 |

## Course Catalog

0 Credit Hours. The Machine Learning Laboratory course provides students with hands-on experience in developing, implementing, and evaluating machine learning algorithms and models. Building on theoretical concepts covered in introductory machine learning courses, this lab focuses on practical applications and real-world datasets. Students will engage in a variety of projects that cover supervised and unsupervised learning techniques. They will learn to use popular programming languages and frameworks such as Python, TensorFlow, and scikit-learn to build and optimize machine learning models. Key topics include data preprocessing, feature selection, model training and validation, hyperparameter tuning, and performance evaluation. Students will also explore ethical considerations and best practices in machine learning, including bias detection and algorithm transparency. By the end of the course, students will have a solid understanding of machine learning workflows, enabling them to formulate and solve complex problems using machine learning techniques. They will be equipped to tackle real-world challenges and contribute to ongoing research in the field of artificial intelligence.

**Teaching Method:** On Campus

## Class Schedule & Room

Section 2:
 Lecture Time: Tue : 13:30 - 15:30
 Room: CPE07-M7L2

Section 3:
 Lecture Time: Thu : 13:30 - 15:30
 Room: CPE07-M7L2

Section 4:
 Lecture Time: Thu : 13:30 - 15:30
 Room: CS06-C5L1

## Tentative List of Topics Covered

| Weeks | Topic | References |
|---|---|---|
| Week 1 | No Lab | |
| Week 2 | Environment Setup | |

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| Week 3 | Reading Data and uploading data on Google Colab | |
| Week 4 | Data Preprocessing and Cleaning | |
| Week 5 | Exploratory Data Analysis (EDA) (Statistics + Plots and Charts) | |
| Week 6 | Supervised Learning - Regression Techniques | |
| Week 7 | Supervised Learning - Classification Techniques | |
| Week 8 | Model Evaluation Metrics for Regression and Classification (using SVM and NB) | |
| Week 9 | Model Evaluation Metrics for Regression and Classification (using Decision Trees) | |
| Week 10 | Feature Engineering and Selection and Model Optimization | |
| Week 11 | Ensemble Methods - Bagging and Boosting | |
| Week 12 | Unsupervised Learning - Clustering Techniques | |
| Weeks 13, 14 | Projects | |

| Relationship to Program Student Outcomes (Out of 100%) | | | | | |
|---|---|---|---|---|---|
| SO1 | SO2 | SO3 | SO4 | SO5 | SO6 |
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