Machine Learning Foundations - 2023

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Course Objective: This course aims to provide a comprehensive understanding of the core principles of Machine Learning (ML) with hands-on training on applying machine learning to solve real-world problems. A learner who completes this course should be able to define a machine learning problem, understand the solution path, and display the ability to carry out the end-to-end process of building a machine learning application.

Career Prospects: This course covers essential foundational knowledge in ML for learners who want to start or advance their careers in the Data Science/ML field. This includes positions such as Data Scientist, ML/AI Engineer, Data Engineer, Data Analyst, AI/ML Developer, Data Science/ML Consultant, and Freelancer.

Target Audience: Students, Corporates seeking Data and AI Strategy, Corporates, and Individuals who are beginners to Machine Learning.

Level: Beginner-Intermediate

Duration: 60 hours (Including Project and Recorded Lessons)

Schedule and Format:

- Schedule: 3-month program/12 weeks, two sessions per week.
- Format: Live/Recorded Lectures, Demonstrations, Hands-on Exercises/Labs.
- Evaluation: Quizzes (2), Project (1)
- Additional Practice: Students must spend extra time covering hands-on exercise materials and the capstone project.

Training Conducting Medium: English

Prerequisites:

- Basics understanding on in computer programming.
- Foundational Knowledge in mathematics and statistics (G.C.E. O/L, High School Math).
- Working knowledge in computer applications: spreadsheet, word processor and presentation authoring.

Platform and Data for Hands-on Exercises and Project:

- Programing Language: Python 3 will be used as the primary programming language in teaching, practice examples and assignments.
- Python Libraries: Numpy, Pandas, Matplotlib, Seaborn, Scikit-learn, TensorFlow/PyTorch, Flask, Streamlit.

- Applications/Tools: Jupyter Notebook/Lab, IDE (Spyder/VS Code/Atom/PyCharm), Spreadsheet (MS Excel/LibreOffice Calc).
- Data: Data for hands-on exercises, case studies, and projects will be obtained from open data repositories.
- Computing Environment: Cloud platform (e.g., Google Collab) or locally installed Python distribution in student's PC.

Topics Covered in the Training Program

#	Topic Name	| Training Week #											
1	Introduction to Machine Learning (ML), History, and Applications	1											
2	Setting up Python Computing Environment and Libraries ‡*	1	2										
3	Knowledge Foundations to ML (Statistics, and Mathematics) ‡*		2	3									
4	Exploratory Data Analysis (EDA) and Feature Engineering ‡*			3	4								
5	Supervised Machine Learning: Regression and Classification ‡*					5	6						
6	Unsupervised Machine Learning: Clustering ‡*							7					
7	Design, Develop and Deploy ML Solutions ‡*							7	8	9			
8	Introduction to Explainable AI/ML ‡*									9			
9	Introduction to Deep Learning and AI (Image and Text Applications) ‡*										10	11	
10	Capstone Project *⚐											11	12

* Topic includes hands-on programming exercises.

‡ Topic Include Recorded Lessons

⚐ Topic Include Independent Project

Evaluations and Grading:

	Topic #	%
Quiz1 (Basic Concepts)	1-6	30
Quiz 2 (Advanced Concepts, Deep Learning and Application Building)	7-9	20
Deliverable and Project Report	10	40
Presentation (video narration)	10	10
		100

Completion Requirement:
- 80 % Attendance (at least 19 out of 24 sessions)
- Final Grade > 70 %
- Completion with Distinction: Final Grade > 90 %

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