**Couse1 : Data Science & Machine learning**

Duration: 12 hours

This course is designed for both beginners with some programming experience and experienced developers looking to make the jump to Data Science and Machine learning!

This course is designed to teach students, staff and professionals (industry-oriented), end of the course they will learn about

* Use Python for Data Science and Machine Learning
* Implement Machine Learning Algorithms
* Learn to use NumPy for Numerical Data
* Learn to use Pandas for Data Analysis
* Learn to use Matplotlib for Python Plotting
* Learn to use Seaborn for statistical plots
* Use Plotly for interactive dynamic visualizations
* Use SciKit-Learn for Machine Learning Tasks
* K-Means Clustering
* Logistic Regression
* Linear Regression
* Random Forest and Decision Trees
* Neural Networks
* Support Vector Machines

Agenda of this course :

This course will cover all the below topics in two days’ workshop:

* Programming with Python
* NumPy with Python
* Using pandas Data Frames to solve complex tasks
* Use pandas to handle Excel Files
* Connect Python to SQL
* Use Matplotlib and Seaborn for data visualizations
* Use Plotly for interactive visualizations
* Machine Learning with SciKit Learn, including:
* Linear Regression
* K Nearest Neighbors
* K Means Clustering
* Decision Trees
* Random Forests
* Natural Language Processing
* Neural Nets and Deep Learning
* Support Vector Machines

All the topics will be covered with examples and a sample code will be provided.

Handson will be provided with google Colab or VS code.

**Data Science & Machine Learning Workshop Agenda (9:30 AM - 4:00 PM)**

**Target Audience:** (consider mentioning the experience level - beginner, intermediate, advanced)

**Learning Objectives:** (list 2-3 key takeaways participants should gain)

**9:30 AM - 10:00 AM: Introductions & Icebreaker (30 min)**

* Welcome and introductions of Presenter (5 min)
  + Workshop facilitator introduction
  + Brief introductions from participants (name, background, and expectations)
* Icebreaker Activity (15 min) - (Choose an activity related to AI concepts or teamwork)
  + Example: Matching game with AI terminology or a collaborative problem-solving activity.
* Workshop Overview (10 min)
  + Briefly explain the agenda and learning objectives.

**10:00 AM - 11:00 AM: Demystifying AI (60 min)**

* What is AI? (15 min)
  + Definition, history, different types of AI (Machine Learning, Deep Learning)
  + Real-world examples of AI applications.
* How AI Works (20 min)
  + Basic explanation of core concepts (algorithms, data, training) with visuals.
* Interactive Discussion & Q&A (15 min)
  + Encourage questions and address any misconceptions about AI.
* Short Video (Optional - 5 min)
  + Show a short, engaging video on AI applications.

**11:00 AM - 11:15 AM: Tea Break (15 min)**

* Refreshments and networking opportunity.

**11:15 AM - 12:30 PM: Exploring AI Applications (75 min)**

* Focus on 2-3 specific AI applications relevant to the target audience (e.g., healthcare, finance, creative industries). (20 min per application)
  + Explain the application in detail.
  + Discuss the benefits and potential challenges of AI in this domain.
  + Show real-world examples (case studies, demos)
* Group Discussion (15 min)
  + Facilitate a discussion on the impact of AI in these chosen fields.

**12:30 PM - 1:30 PM: Lunch Break (60 min)**

* Catered lunch or designated break time for participants.

**1:30 PM - 2:30 PM: Hands-on Activity (60 min)**

* Choose an activity based on the workshop level (beginner - coding-free exploration, intermediate - basic coding with AI libraries, advanced - building a simple AI model).
  + Provide clear instructions, resources, and support throughout the activity.
* Group Collaboration (15 min)
  + Encourage participants to work together, share ideas, and troubleshoot any issues.

**2:30 PM - 2:45 PM: Tea Break (15 min)**

* Refreshments and opportunity to discuss the hands-on activity.

**2:45 PM - 3:45 PM: The Future of AI (60 min)**

* Ethical considerations of AI (15 min)
  + Discuss potential biases, transparency, and responsible AI development.
* Impact of AI on Society (20 min)
  + Explore potential job market changes, social implications, and future trends.
* Q&A and Open Discussion (25 min)
  + Encourage questions and open discussion about the future of AI.

**3:45 PM - 4:00 PM: Wrap-up & Next Steps (15 min)**

* Briefly summarize key takeaways from the workshop.
* Provide resources for further learning (articles, online courses, communities).
* Thank participants for attending and answer any final questions.