

AI for Climate Change

Detailed Teaching Agenda

Part I: Machine Learning Basics

Lecture topic	Lecturer	Hours
Introduction to AI, ML and DL	M. Ronco	1
Regression and Classification, bias and variance trade-off	M. Ronco	3
Loss functions	M. Ronco	1
Optimization, gradient descent	M. Ronco	1

Part II: Advanced Machine Learning

Lecture topic	Lecturer	Hours
Ensemble methods, random forest, gradient boosting	M. Ronco	1
Support vector machines	M. Ronco	1
Unsupervised learning	M. Ronco	1
Interactive exercise	M. Ronco	3

Part Iii: Deep Learning & Large Language Models

Lecture topic	Lecturer	Hours
Introduction	M. Ronco	1



Multi-layer perceptron	M. Ronco	1
Convolutional Neural Networks	M. Ronco	1
Recurrent Neural Networks	M. Ronco	1
Intro to LLM, chatGPT	M. Ronco	1

Part IV: Applications to Climate Change

<i>Lecture topic</i>	<i>Lecturer</i>	<i>Hours</i>
Temperature and CO2 concentration	M. Ronco	1
Wildfires prediction, Rain forecasting	M. Ronco	1
Storm classification	M. Ronco	1
Temperature prediction	M. Ronco	1
Food insecurity, land cover, human displacement and conflicts	M. Ronco	1
Final evaluation and grading	M. Ronco	3