UNIVERSITA' DEGLI STUDI DI CATANIA

DOTTORATO DI RICERCA IN SCIENZA DEI MATERIALI E NANOTECNOLOGIE

COURSE DESCRIPTION

Name	Machine Learning Tools for Material Sciences
Teacher(s)	Prof. Alessandro Ortis
Email	alessandro.ortis@unict.it
CFU* (lecture+lab [h])	e.g.: 2 (12+0)
Assessment **	By slide presentation

* 1 CFU = 6 h lectures OR 12 h in lab OR a combination (3h lectures+6h lab, or 4+4, or 2+8, …)

** it must be within the course duration. Please, indicate: written, oral, by slide presentation.

PROGRAM

The course introduces the main machine learning tools applicable to research in materials science and nanotechnology. With a practical and accessible approach, supervised learning algorithms and automated data analysis techniques will be presented, using examples drawn from real-world applications.

The course includes practical examples and resources to develop familiarity with the entire workflow, from data preprocessing and model selection and training to the interpretation of results.

Guided studies based on real-world datasets will also be provided to simulate machine learning pipelines applied to research.

REFERENCES

I. Goodfellow, Y. Bengio, and A. Courville, Deep Learning, MIT Press, 2016. ISBN 978-0-262-03561-3.

A. Géron, Hands-On Machine Learning with Scikit-Learn, Keras, and TensorFlow, 3rd ed., O'Reilly Media, 2022. ISBN 978-1-098-12596-7.