

**Course announcement**  
**Topics in engineering mathematics and coding**  
**"Coding for Data Science"**  
**Dott.ssa Ing. Alessia Amelio**



**Hours 12**  
**Classes will be in English**  
**Compulsory attendance**

At the end of the course, the student is required, in a **short oral interview**, to apply the aspects covered to topics of interest to him. The short oral interview is compulsory to obtain **cfu 1,5**.

**ABSTRACT**

*"Coding for Data Science"*

*The purpose of this course is to provide the basic concepts of Machine Learning and Deep Learning through the use of dedicated programming environments and frameworks. First, an overview of the data analysis process will be provided followed by an introduction to the problem of learning. The basic notions of classification, regression and clustering will then be studied in depth, with particular attention to the knowledge discovery process. In this context, different regression and classification models will be analyzed, including decision trees, linear and logistic regression and artificial neural networks, with particular focus on Bayesian networks. In addition, several clustering algorithms will be analyzed, including K-Means, hierarchical clustering and density-based clustering. The second part of the course will focus on Representation Learning and Deep Learning architectures. In particular, Convolutional Neural Networks and Recurrent Neural Networks will be added. Each topic will be addressed through the use of dedicated programming environments, such as Matlab and Python. The main libraries for data analysis, Machine Learning and Deep Learning will then be shown and explained. As a further application example of data analysis, the calculation of the fractal dimension starting from a set of images will be shown.*

✉ **Register by** sending email to:

[tea.taraborelli@unich.it](mailto:tea.taraborelli@unich.it) & [alessia.amelio@unich.it](mailto:alessia.amelio@unich.it) (in cc)

*The short course will be online through Microsoft Teams platform. Participants who register for attending the course will receive by email the link for connecting to the course.*

TIMETABLE			
<b>MONDAY</b>	3 July 2023	15:00	18:00
<b>TUESDAY</b>	4 July 2023	15:00	18:00
<b>MONDAY</b>	10 July 2023	15:00	18:00
<b>TUESDAY</b>	11 July 2023	15:00	18:00