

**Course Syllabus for  
Industry 4.0 PhD  
(years 2022-23 /2023-24)**

<b>Course title</b>	Environmental data analysis
<b>Scientific Discipline Sector</b>	INF/01
<b>Hours of instruction</b>	20 hours
<b>CFU</b>	2 CFU
<b>Semester</b>	First semester
<b>Goal</b>	The course will provide an overview of Machine Learning and Deep Learning strategy in environmental applications. At the end of the course, the participants will be able to design, develop and apply statistical learning methods to the environmental data to produce results. Each lesson will consist of lecture and numerical examples.
<b>Syllabus</b>	Environmental data: acquisition and management Modern Programming methods Environmental data: visualization and processing Environmental modeling Machine Learning for environmental data science Deep Learning for environmental data science Multidisciplinary Approaches to Environmental Studies Case studies using MATLAB
<b>Bibliography</b>	James, Witten, Hastie, Tibshirani (2013), <i>An Introduction to Statistical Learning (with Applications in R)</i> , Springer-Verlag  Hastie, Tibshirani, Friedman (2009), <i>The elements of statistical learning: data mining, inference and prediction. 2nd edition</i> , Springer-Verlag  Slides and support material from lecturer.
<b>Examination method</b>	Final project presentation and oral discussion.