

**The optional course Artificial Intelligence Models for Climate Change presentation**

The main purpose of the optional course Artificial Intelligence Models for Climate Change is to investigate the problems which contribute to climate change such as deforestation, traffic, and forest fires, from an applied perspective of the computer science field in general, and artificial intelligence (AI) in particular.

Practically, at this course, we want to discover real problems which contribute to climate change, identify solutions and try to offer applications (projects) to reduce the climate change impact.

The novelty of the course is due to the approached real-life domains: earth, environment, agriculture and society.

AI algorithms and methods will be used to process data sets from these domains.

The development and collaboration components are directly linked with the diversity offered by our University, because at this course there are invited speakers and guests from other faculties from the University.

With the guests, we will discuss and debate the problems from their domains and use our ability to find solutions from a Computer Science/Artificial Intelligence perspective.

Besides the guests from other faculties, there will be other specialists invited from other companies and passionate people with the topic of this course. In this way, is it assured the transdisciplinarity of our course.

The lectures will be dynamic:

- First, the invited speakers will present the problems from their fields.
- Second, together with the guests, the students will investigate (through questions) and specify the actual requirements.
- Then later, during the labs, students will have hands-on activities when they will implement the discussed solutions.

At the end of the semesters, these solutions will be presented as projects in front of the "clients" – the invited speakers.

The AI methods used in the course are various but mainly clustering, classification, regression and ensemble methods.

Another issue that we want to address is to identify and create real data sets for these domains (to be a starting point for next years projects).

At the labs, students will work in mixed groups formed of 3-4-5 students (4 is recommended) from computer science and mathematics and computer science domains (different years).

The group working method is preferred because we want to contribute at improving the skills of collaboration and also peer-review evaluation within a group, skills very necessary later in job activities.

The used and recommended language programming is Python with all its additional tools.

Some projects example from last year course:

- \* Automatic counting of fruit in an orchard to identify the optimum number of employed workers for the job of collecting fruits
- \* Flood forecasting on a river from Romania (Olt) based on the quantity of precipitation, humidity and temperature from the area
- \* Deforestation detection based on google earth images
- \* Gardening using a smart irrigation system

This course is addressed to students from computer science specializations and mathematics and computer science specialization, with background in Artificial Intelligence and Statistics.

Summarizing, the applicability and the utility of this course is to combine real-life issues generated by the climate change with possible solutions such as projects from our AI domain, approved by the invited speakers.

