



**Universidade do Minho**  
Escola de Engenharia

**September 25th-29th, 2023**

## **Cyber-Physical Systems Design in the context of Industry 4.0**

This course is created following the application (in 2022) to the Mobility Program for Higher Education Students and Staff funded by the Erasmus+ Program, under Key Action 1: Individual Mobility for Learning Purposes (KA131) - Blended Intensive Programs (BIP) and after approval by the Portuguese National Agency.

### **Scope**

The main objective consists on providing, to the students, knowledge and solid foundations in the Cyber-Physical Systems Design, taking into account, mainly, the physical part of these systems. The target students are students from 1<sup>st</sup> cycle of superior studies, in Mechanical Engineering, or related domains, where the taught subjects may be of their own interest

### **Topics**

*This course is composed by five modules supervised by  
Very skilled Professors in the respective domains:*

In the Module "**Modelling and Simulation of Mechanical Behavior of Cyber-Physical Systems**" – supervised by **Prof. Pierluigi Rea**, from University of Cagliari, Italy - the student must be able to simulate the behavior of a mechanical system (controller and physical part) and use simulation techniques and software such as Matlab, Autosim-200, or other similar;

In the module "**Assessment of Risk of Cyber-Physical Systems**", supervised by **Prof. Anna Burduk**, from Wrocław University of Science and Technology, Poland - student must be able for assess and prevent risk during operation of Cyber-Physical Systems;

In the module "**Robotic Applications of Cyber-Physical Systems**" - supervised by **Prof. Erika Ottaviano**, from University of Cassino and Southern Latium, Italy - student must be able of understanding the functioning and programming of robots in different practical situations; considering dedicated software tools such as Matlab.

In the module "**Interconnectivity of Cyber-Physical Systems**"- supervised by **Prof. Camelia Avram**, from Technical University of Cluj-Napoca, Romania - student must be able for defining the architecture for the distributed controller and develop the corresponding controller program;

In the module "**Smart Maintenance of Cyber-Physical Systems**" - supervised by **Prof. Katarzyna Antosz**, from Rzeszów University of Technology, Poland - student must be able for consider, during design phase, aspects related with maintenance and provide some measures and calculations for being possible smart maintenance during life-cycle of the equipment.

## Partners



Universidade do Minho  
Escola de Engenharia

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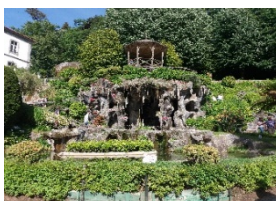
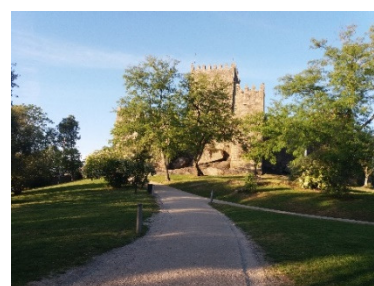
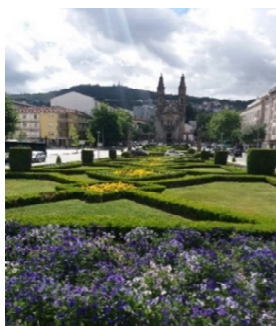


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## Course Place

The Course will be held in September 25th-29th, 2023, at University of Minho, in Guimarães, a Portuguese world heritage city, 55 kilometers to the north of Porto.



## Contact

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