Educational Robotics

COURSE CONTENT:

1. Integrating Robotics in Educational Practice
    - Added value of learning frameworks enhanced by robotics
    - Educational Robotics and Computational Thinking
    - Challenges in educational robotics to support holistic approaches in STEM and STEAM education
2. Educational Robotics (ER)
    - Basic concepts and characteristics of a robot
    - Hardware/software platforms for educational robotics and robotics simulators
    - Robotics as an educational tool in primary and secondary education
    - Pedagogical frameworks for integrating ER into educational practice: inquiry-based approach, project method in an interdisciplinary context
3. Robotic Technologies with Tactile User Interfaces
    - Learning through play: robots such as Thymio, Edison, Makey Makey, and educational tactile interfaces
    - Description of the robot and the programming environment suite for Thymio
    - Familiarization with robot components (sensors, actuators, lens) and visual programming environments VPL (Visual Programming Language), Scratch, and Blockly
4. The Micro
    - Platform
    - Description of the Micro
    - Core and peripheral components (sensors, actuators, motors)
    - Simulation programming environments (MakeCode, block programming)
    - Building a robot with Micro
5. Arduino Platforms
    - Introduction to microcomputing systems
    - Description of Arduino UNO (controllers, GPIO, A/D, etc.)
    - Peripheral devices (sensors, actuators, communication modules)
    - Programming environment, physical computing, Fritzing, and simulation environments
6. Lego Mindstorms Platform
    - Basic functionalities
    - Core and peripheral components (sensors, actuators, motors)
    - Programming environments for Lego Mindstorms and simulation environments