INTERMEDIATE ARTIFICIAL INTELLIGENCE CAMP
Syllabus

General description:

The intermediate artificial intelligence course focuses on developing practical projects to solve real-life scenarios. Using the knowledge acquired in the beginner course, the student will bring the digital assistant to life using robotics, computer vision systems, natural language processing, and machine learning.

Students will have the opportunity to develop their own practical artificial intelligence applications. Using scratch programming, the student will provide the digital assistant with a variety of skills. Each skill represents useful knowledge for the robotic head to resemble a smart, capable, and human-like assistant.

To get the most out of this course, taking the beginner course is **highly recommended.**

In this course, the student will learn to:

- Solve simple mathematical operations using voice commands
- Transform audio commands to mechanical movement
- Manage medium-sized Excel databases
- Identify and store data concerning facial features
- Request and store information from a web service
- Develop graphical user interfaces

Novum Education courses:

Educational Robotics is the academic learning of the automation of a wide variety of processes. From the simplest or general robotics (Bionic, Commercial, Industrial, Vehicles) to the most complex or specialized robotics (Arduino, Internet of Things, Artificial Intelligence) that empower the student's cognitive processes.

Our Artificial Intelligence courses incorporate STEM, in which Science, Technology, Engineering, and Mathematics subjects are naturally integrated into the course projects. We ensure that students fully understand the lessons without the need for hypothetical cases.

Educational Robotics is a discipline based on the cognitive theory of teaching-learning that allows students to move from the concrete to the abstract and vice versa. It allows them to solve problems and facilitates the development and implementation of multiple projects. Students acquire knowledge and transfer it to diverse fields. The use of Robotics in different national and international educational environments is becoming more and more common as it is an innovative strategy with enormous potential in the integral training of students by promoting critical and creative thinking.

Our educational offer is based on multiple educational models and learning strategies such as:

- Project-based learning
- Problem-based Learning
- Competency-based learning
- Meaningful Learning

- Active learning
- The New Taxonomy of Educational Objectives by Marzano and Kendall

These provide the development of the skills needed to thrive in 2020 and the Fourth Industrial Revolution that we are experiencing nowadays. The World Economic Forum mentioned some transversal competencies in their report "The Future of Jobs" published in January 2016 and that our courses foster:

1. Complex Problem Solving
2. Coordinating with Others
3. People Management
4. Critical Thinking
5. Negotiation
6. Quality Control
7. Service Orientation
8. Judgment and Decision Making
9. Active Listening
10. Creativity

The whole curriculum is based on national standards to ensure the compatibility with state educational programs and keeps the quality of its contents across multiple dimensions.

- CCSS – Common Core State Standards
- NGSS – Next Generation Science Standards
- ISTE – International Society for Technology in Education
- STL – Standards for Technological Literacy

Projects in this course:
Our courses are designed to be personalized, self-managed, and self-paced. Everything happens inside our unique and state-of-the-art web platform MakerSTEAM and combines concepts and theory with reality and practice. This course can be taken by a single student or in teams. Students become self-sufficient in their learning, gradually being able to build a mental structure that allows them to be expert lifelong learners. They will learn to learn.

Our learning path:
Each project follows a sequence of activities focused on providing the student with theoretical and practical knowledge about real-life applications.

In each sequence, the student will:
- Know a specific set of goals and competencies to be developed
- Acquire project contextualization through a conceptual framework
- Follow a construction manual
- Control a robotic device through programming
- Challenge him/herself by pushing each project capacity beyond what is expected
- Analyze the obtained results

Each learning path has the learning objectives and competency to develop in each project.

There are 15 projects included in this course. Each project's final product will be an automated digital assistant with a variety of skills.

Course projects		
Mathematician robot Difficulty level: ★★★	**Motor control using voice command** Difficulty level: ★★★	**Simple music selection** Difficulty level: ★★
Music selection using databases Difficulty level: ★★★	**Music recommendation based on emotions** Difficulty level: ★★	**Local weather monitoring station** Difficulty level: ★★
Currency conversion Difficulty level: ★★	**Date & time detection** Difficulty level: ★★★	**Facial features recognition** Difficulty level: ★★★
Wolfram Alpha web service WolframAlpha Difficulty level: ★★	**GUI – Color selection** Difficulty level: ★★★	**GUI – Mathematical operations** Difficulty level: ★★★★
GUI – Hotel kiosk Difficulty level: ★★★★	**Automated raffle** Difficulty level: ★★★	**Chat channel** Difficulty level: ★★★★★

WEF (2016). The Future of Jobs. From World Economic Forum website: https://www.weforum.org/reports/the-future-of-jobs