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Name of the course	Educational robotics and STEAM technologies (beginners - advanced)
Dates of the course	the whole year
Duration of the course	Depends on the requests
Minimum number of places	10
Maximum number of places	30
Type of course	<ul style="list-style-type: none"> ● Mix of Training Course and Job shadowing
If mixed, what is the balance between the activities?	80% course - 20% school visits
The target group is...	<ul style="list-style-type: none"> ● Primary teachers ● Secondary teachers
Summary of the activity	<p>The program is a mix of training courses and seminars with subject specialists.</p> <p><u>A higher educational institution will be the receiving organization and provide the training in Levadia.</u></p> <p>The emphasis is on practical workshops to support development of skills for teaching and training in STEAM subjects, ARDUINO platform, Raspberry Pi, MICRO:BIT python, labview, Lego, Scratch game design, using provided hardware and software. On-site training will take 3 days.</p> <p>Visits in local Robotics/STEAM center.</p> <p>Trainees will learn how to</p> <ol style="list-style-type: none"> 1. use little Bits for curriculum-tied projects in order to solve real-world problems, starting with simple circuit projects and building upon them each year. 2. keep a journal while solving problems, brainstorm ideas, prototype them, test them, redesign them and make them better 3. manage a Makerspace at school

4. blend ART with STEM subjects in order to prepare students for their roles as global citizens

According to our education program there are two level of training:

BASIC LEVEL

ADVANCED LEVEL

BASIC LEVEL (for beginners)

On basic level the participants will understand the computational thinking and the epistemology of STEAM. Participants will learn how to create a didactic scenario involves artifacts, Arduino platform, Micro:bit platform, Edison robot, lego wedo, electronic components, sensors and actuators. They will use design software to create 3D artifacts for their STEAM applications. They will handle all the above components and devices to create simple application under specific didactic scenarios. They will learn to programming using blocks!

Topics of BASIC STEAM SCENARIOS:

Participants will learn to programming Arduino and Micro:bit, Edison robot, lego, under fantastic scenarios! Based on interesting of participants and the specialization of teachers, participants involves to specific scenario.

Help a Robot to escape from a maze

Using open hardware and open software learners will develops a robot using sensors to Obstacle Avoid. After the construction will be a competition in a maze! The competition

involves class subject of: Mats, Physics, Geometry. Architecture, Technology. All in a didactic scenario! Who will escape from the maze!

A scenario based on the experience and the interest of the participants will be implemented:

Robotics in Theatre

Participants will study and develops robotics scenes from ancient Greek mythology. They bring alive the myth of Hercules and Jason with Argo. In this activity the participants learn how to involve education robotics in ART!

Mission to Mars

Under a rescue scenario, learners will save the life of astronauts after a disaster in their station. They develop a robot machine to transfer the astronauts to safe place into the station. The scenario involves different class subjects: Math, Physics, Geometry. Astronomy, Technology, ICT! All in a didactic scenario!

Catch the thief in Louvre museum.

Louvre museum is a magic place for teachers to teach art to students. In this scenario, participants will program the arduino platform to catch a thief who try to steal a famous painting art! In this activity the participants learn how to involve education robotics in ART!

UNPLAGGED STEAM activities

Participants will develop STEAM activities without programming! UNPLGGED STEAM help K6 students to understood physical phenomena and understood the real world! The UNPLGGED STEAM activities have with positive effect and help students with attention-deficit

hyperactivity disorder (ADHD) to learn themselves to concentration in their works!

ADVANCE LEVEL (for experts)

The scope of advance level is to involve the participants to advance programming. They will involve in real problems and they will try to find the best solution! In advance level the participant will learn

- ✓ LabVIEW programming for ARDUINO and Raspberry Pi platform
- ✓ Python programming for MICRO:BIT and Raspberry Pi platform
- ✓ App inventor programming for Bluetooth applications

Participant will use ARDUINO platform MICRO:BIT and RASPBERRY Pi as open hardware to develop their application!

About Labview: LabVIEW is a visual programming language: it is a system-design platform and development environment that was aimed at enabling all forms of system to be developed. LabVIEW object-oriented programming uses concepts from other object-oriented programming languages such as C++ and Java, including class structure, encapsulation, and inheritance. You can use these concepts to create code that is easier to maintain and modify without affecting other sections of code within the application.

CERN using the LabVIEW object-oriented programming!!! : Measuring and controlling, in real time, the position of bulk components to

absorb energetic particles out of the nominal beam core with high reliability and accuracy at the world's most powerful particle accelerator, the Large Hadron Collider (LHC).

It will be a challenge to learn this programming language!

Topics of ADVANCE STEAM SCENARIO:
Participants will learn to programming Labview and python, under fantastic scenarios!

Smart home

Participants will create the smart home of their dreams! Using protocols like Wi-Fi or Bluetooth they develop application to control their devices in their smart house. Participants under activities will understood the philosophy of Internet of thinks.

Automation in greenhouse

Participants will create automations for hydroponic agricultural in a greenhouse. Participants will learn how to measure and control environment magnitudes. Using Arduino platform as hardware, Labview code will control all the process in the greenhouse in real time!

Robotic application using LabVIEW

Participant will create a 4 DOF robotic arm and will learn to program the robotic arm using LabVIEW code. The scope of activities is to introduction the participants to understudy the core of learning machines.

Educational Robotics using Raspberry Pi platform

Participants using python programming and raspberry pi platform will control their own

	<p>robot. The target of this activity is to handle the libraries of python to develop funny applications for students using the Raspberry Pi platform!</p>
<p>Objectives, skills & competencies</p>	<p>Content and pedagogical skills to deliver the content:</p> <ul style="list-style-type: none"> ✓ Development of a scaffolded set of STEAM activities that can be integrated into the curriculum ✓ Training in educational robotics, STEM technologies ✓ Hands-on approach to the study of science, technology, engineering and math ✓ Engineering competencies (design, iteration, prototype development, design reviews, project planning...) ✓ Coding, programming and computational thinking/ Writing code for educational purposes ✓ Data-logging and scientific methods ✓ Contextualized mathematics ✓ Making the study of math and science more visual and creative ✓ Art and design ✓ Making artifacts ✓ Development of 21st century skill sets in students (teamwork, cooperation and collaboration, time management, resource allocation, etc.) ✓ Pedagogical training in how to integrate STEAM into existing or renewed practices/The role of teachers (facilitators, guiding investigations and encouraging discussion) ✓ Assessment and evaluation activities to measure what students are learning ✓ Educating the community about STEAM
<p>Schedule - brief description</p>	<p>Accommodation Levadia: hotel in the city centre (6 nights) Sunday Evening: Arrive in Levadia Monday–Get to know each other and the place /icebreaking games/Course Expectations</p>

	<p>Training: Science Focus AM: STEAM-- An overview PM: Practical Science activities for the primary/secondary classroom Evening: Group farewell dinner Tuesday– Training: Technology Focus AM: Digital Competency PM: Practical Technology activities for the primary/secondary classroom Evening: Free Wednesday– Robotics center visit The day will be spent observing STEAM lessons and meeting with teachers Evening: Free Thursday: Job shadowing Friday: Job shadowing/Robotics in special needs education - A visit to a school. At the end of every day we will reflect on what have we done during the sessions, what was the purpose and how can the participants use this back home. All five days of the programme will be held in the premises of -ASPAITE – a higher institution, and the -Robotics Center in Levadia. Saturday Departure</p>
<p>Any further details about the activity</p>	
<p>Cost breakdown</p>	<ul style="list-style-type: none"> ● Course = 400 € ● Refreshments & one common dinner = 100 ● Cultural activities (outside the course) =100
<p>If any other costs, please detail below:</p>	<p>Cultural activities (outside the course) depend on the request</p>