KA1 ERASMUS+

FOR EDUCATORS & TEACHERS

"STEM Education"

Presentation

The ***"STEM Education"*** course provides STEM (Science, Technology, Engineering and Mathematics) teachers with resources and ideas to develop more engaging science lessons and to increase students' interest for STEM subjects and careers.

The introductory presentation of SCIENTIX, the online Community for Science Education in Europe, follows a series of lectures and short workshops. The participants will be introduced to attractive ways of introducing various concepts of science that are part of the contemporary science curricula, such as, atmospheric and hydrostatic pressure, mechanics, automate systems etc., based on important inventions that were made more than two thousand years ago by Aristotle, Pythagoras, and other ancient Greek philosophers and scientists. Participants will be empowered to invest on ancient wisdom in order to facilitate student's comprehension of science knowledge, while cultivating positive attitudes towards science and developing useful cognitive skills.

After the journey to the technological achievements of ancient Greek culture follows an overview of modern and flexible tools, that can be applied to stem education methods. In more detail, this module includes:

- The Creation of applications for computers and mobile devices, with drag and drop programming environment, using blocks
- The Implementation of robotic constructions by connecting sensors and actuators and programming them visually
- The Development of analogue and digital electronic circuits with physical equipment, as well as with virtual using simulation applications
- The Acquaintance with procedures for designing, digitizing and producing objects using 3D printing technology
- The Combination of all the above with low-tech tools of making and tinkering as a potential driver of creativity, excitement, and innovation in science learning.

Trainees will be encouraged to think creatively, propose and test solutions for different real life scenarios and problems. After completing the course, they will be able to provide their students an effective means to engage in exploring STEM concepts, practices and phenomena.

Objectives

The aims of the course will be:

- To support teachers who are or will be involved in the teaching of STEM, either as a direct subject or as an element of another subject, with their delivery of computer science theories, concepts, principles and activities
- To provide teachers with concrete ideas and resources concerning STEM
- To provide teachers with an overview of the societal context and rationale for the teaching of programming
- To offer teachers a place of exchanging, with other like-minded peers, resources, solutions to real life problems and provide feedback and guidance to each other

Pre-departure

Trainees will receive a questionnaire, which will provide information on their teaching background, qualifications, and previous experience with STEM, programming, robotics, Electronic circuits and 3D Printing.

Target groups

The ***"STEM Education"*** training course is addressed to schoolteachers, VET teachers and trainers who wish to acquire the skills for introducing new methodologies in their schools.

The Trainers

All trainers are experienced in STEM. They are experienced in European projects and in projects on how to implement STEM at school.

Labs

The lessons will take place in modern full equipment laboratories.

Language of the course

English

Program

Day 1: 6 hours

Participant arrival

Individual orientation and information about the venue and the city

Presentation of the course, the trainers and participants;

SCIENTIX: The Community for Science Education in Europe

- Projects
- Resources
- Online community (discussion forum, Communities of Practice, chat, on-line meeting rooms, workshops, webinars)

Day 2: 6 hours

Circuit boards and activities

- Create analog and digital electric circuits

- Use simulators to experiment with
- Program microcontrollers and interconnect them with actuators (LEDs, LCDs, lights, speakers, motors) and sensors (buttons, infrared receivers, distance detectors)
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Robotics

- Build and program a robot
- Use of sensors and actuators
- Problem-solving activities
- Evaluate and optimize performance

Day 3: 6 hours

3d printing

- Design models in 3d space and Capture real things
- 3d printing of solid objects

Goodbye Evening

Day 4: 6 hours

Ancient Greeks' conceptualization of the universe. Aristotle's Cosmology and the theory of "natural locations."

Ancient Greek Technology Part I: Three important inventions concerning atmospheric pressure:

- The "philosophical stone" of Heron
- The "magical tap" of Heron and
- Pythagoras's cup.

Construction / representation and explanation of the three inventions with simple materials existing in a science school laboratory and their value in introducing science concepts (participatory and interactive part).

Ancient Greek Technology Part II: Simple ancient Greek machines. Construction / representation and explanation of the several simple ancient machines with simple materials existing in a science school laboratory and their value in teaching science and applications of scientific knowledge.

Visit to the museum of ancient Greek technology

Day 5: 6 hours

Practice and reflect upon learning by doing with STEM

Space for discussion of future cooperation and planning follow up activities

Course roundup and final evaluation

Validation of learning outcomes and certification ceremony

Participants' departure

Fees

Course fee: 350,00€ (VAT included). It includes:

- ✓ Preparation for the course
- ✓ Training materials
- ✓ Administration costs

- ✓ Organizational costs

Follow-up

Trainees will be given soft and hard copies of all lesson materials, which they can review at their leisure in addition to presenting them to their colleagues at their own organizations. In addition, a e-community of participants will be created in order to exchange ideas/experiences.

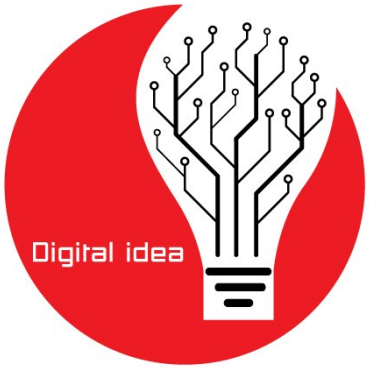
2018

26/03/2018 – 30/03/2018 Larissa

19/11/2018 – 23/11/2018 Larissa

If you have a group of 6 staff or more, we can organize training at any convenient dates.

Registration Form



digitalidea.gr

info@digitalidea.gr

digitalidea.gr

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