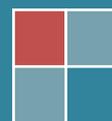


**Course  
Catalog  
2020-2021**

# Robotics in STEAM Education

Erasmus+ KA1 Course

Erasmuslearn Training Center  
[www.erasmuslearn.eu](http://www.erasmuslearn.eu)  
Agia Varvara,  
Heraklion, Crete, Greece  
Organisation ID: E10020547



## ✓ **Summary**

The speed of change in our society has been accelerating since the birth of the Internet. New technological tools are being introduced into our daily life more rapidly than ever before. Among a lot of various technological advancements, the speed of the changes that robotics technology has created has been drastically increasing in recent years. The world and its economy are changing in such a rapid pace that it is impossible to predict what the economy will look like even at the end of next week. Despite all the drastic changes taking place in the world, public education has maintained almost the same system since its establishment in the middle of the nineteenth century. Although the requirements for an effective workforce have changed at the same speed as technological advancements, the majority of schools are continuing what was done in the past with little hope that they can adequately prepare students for the future. Some even state that if we could have teachers from the nineteenth-century time travel to our schools, they would have no problem teaching our students. Because current public education places a heavy emphasis on memorization, our schools and curriculum are astonishingly similar to those in the nineteenth century.

Learning with educational robotics provides students, who usually are the consumers of technology, with opportunities to stop, question, and think deeply about technology.

When designing, constructing, programming, and documenting the development of autonomous robots or robotics projects, students not only learn how technology works, but they also apply the skills and content knowledge learned in school in a meaningful and exciting way. Educational robotics is rich with opportunities to integrate not only STEM but also many other disciplines, including literacy, social studies, dance, music, and art, while giving students the opportunity to find ways to work together to foster collaboration skills, express themselves using the technological tool, problem-solve, and think critically and innovatively. Educational robotics is a learning tool that enhances students' learning experience through hands-on mind-on learning. Most importantly, educational robotics provides a fun and exciting learning environment because of its hands-on nature and the integration of technology.

This course aims to promote robotics in classroom by connecting robotics learning with STEAM (Science, Technology, Engineering, Art + Design and Math), an educational framework that brings reality into the classroom by connecting different subjects together in a way that they will relate to both the real and business world and to each other.

## ✓ **Purpose**

The main purpose of the course is to help teachers to improve their knowledge in Robotics and S.T.E.A.M in education with their students in their classroom.

## ✓ Objectives

- ✓ To involve teachers in learning activities related to technology, engineering, math, art and science (STEAM).
- ✓ To provide the theoretical background of STEAM.
- ✓ To experience through hands-on activities to learn the STEAM content, but also gain self-efficacy and a new view of their own capabilities as STEAM teachers.
- ✓ To access to the benefits of project-based learning through robotics.
- ✓ Discover the usefulness of Arduino in STEAM education.
- ✓ To provide basic training on topics such as controls, automatisms, robots and programmable machines.
- ✓ To familiarize with current use of robotics and coding in nowadays education Trends.

## ✓ Target Groups

Teachers: primary, secondary, vocational, adult, special needs; - Teacher trainers; - Headteachers; Principals; Managers of schools.

## ✓ Methods & Tools

Lectures, exercises, discussions, teamwork, role-playing, study visits.

## ✓ Agenda

<b>Day 1</b>	<ul style="list-style-type: none"><li>✓ Introductory meeting, explanation of practical arrangements, presentation of timetable</li><li>✓ Information about course venue</li><li>✓ Ice-breaking activities</li><li>✓ Introduction in STEAM Education and in the world of robotics.</li></ul>
<b>Day 2</b>	<ul style="list-style-type: none"><li>✓ Teaching children to develop a scientific mind and attitude.</li><li>✓ Teaching the skills of scientific enquiry processes.</li><li>✓ The importance of creative thinking.</li><li>✓ The importance of STEAM education (Lecture and brainstorming activities).</li><li>✓ The structure of STEAM lessons for children, imitating the real science workflow.</li></ul>

<p><b>Day 3</b></p>	<ul style="list-style-type: none"> <li>✓ Software support and computer simulations on science experiments.</li> <li>✓ Introduction to the Arduino software and C++ coding language.</li> <li>✓ Making projects with the help of your own Arduino set (which our company will give to you).</li> </ul>
<p><b>Day 4</b></p>	<ul style="list-style-type: none"> <li>✓ Software support and computer simulations on science experiments.</li> <li>✓ Introduction to the Arduino software and C++ coding language.</li> <li>✓ Making projects with the help of your own Arduino set (which our company will give to you).</li> </ul>
<p><b>Day 5</b></p>	<ul style="list-style-type: none"> <li>✓ Intro to BeeBots / BlueBots.</li> <li>Intro to Lego WeDo2.</li> <li>✓ Practical sessions in using robotic equipment.</li> <li>✓ Intro to Programming.</li> <li>✓ Intro to Lego Mindstorms EV3.</li> <li>✓ Developing Classroom curriculum using EV3.</li> <li>✓ Practical sessions in using EV3 robotic equipment.</li> </ul>
<p><b>Day 6</b></p>	<ul style="list-style-type: none"> <li>✓ Incorporating Robotics for Secondary Schools.</li> <li>✓ Projects using Lego Mindstorms EV3.</li> <li>✓ Level 2 Developing Classroom curriculum using EV3.</li> <li>✓ Level 2 Practical sessions in using EV3 robotic equipment.</li> </ul>
<p><b>Day 7</b></p>	<ul style="list-style-type: none"> <li>✓ Erasmus+ program: objectives, priorities, actions, forms, budget, tips for applicants.</li> <li>✓ Planning follow up activities, dissemination and exploitation of learning Outcomes.</li> <li>✓ Course Evaluation.</li> <li>✓ Certifications.</li> <li>✓ Discussing possibilities for future cooperation among participants.</li> </ul>