COURSE BROCHURE | ERASMUS+ TRAINING

Hands-On STEM – Coding & Robotics

Bring STEM learning to life through hands-on experiments, introductory coding, robotics simulations and creative engineering challenges.

LOCATION	LANGUAGE	FORMAT	DURATION	COURSE FEE	OID
Porto	English	On-site	6 days	€580	E10201112

€580 per participant for 6 days in Porto, Portugal. Check current editions, fee and inclusions before booking.

Course description

Hands-on STEM education encourages learners to investigate problems, test ideas and discover how science, technology, engineering and mathematics connect to everyday life. Through practical experiments, coding activities and creative challenges, educators can help students develop curiosity, logical thinking, collaboration and problem-solving skills. These approaches make complex concepts more accessible and encourage active participation across different educational settings.

This practical course introduces teachers and trainers to engaging STEM activities using introductory programming, educational robotics, scientific investigation and engineering design. Participants will practise block-based coding, investigate movement and sensor concepts, and develop simple experiments and problem-solving challenges. They will work with accessible digital simulations, everyday materials and available educational technologies, discovering how to combine scientific reasoning, mathematical thinking and creative experimentation.

Through hands-on workshops, collaborative STEM challenges and guided project development, participants will design and test a practical learning activity adapted to their subject and learners. Particular attention will be given to inclusive participation, affordable resources, assessment and classroom feasibility, enabling educators to implement meaningful STEM experiences without depending on specialised equipment.

Who the course is for

For educators

Teachers, trainers and education professionals working in primary, secondary, vocational or adult education who want to introduce practical STEM activities into their teaching. Particularly relevant for educators interested in introductory coding, robotics, scientific inquiry, engineering challenges and collaborative problem-solving without relying on expensive equipment.

At a glance

Course level: Basic to Intermediate Professional Literacy

Working language: English. Please contact the team if you are unsure about the course level or working language.

CURRICULUM FOCUS

Hands-On STEM Inquiry / Coding, Robotics & Simulation / Engineering & Collaborative Problem-Solving

View the course, current editions and fees

02 / INTENDED LEARNING OBJECTIVES

Learning outcomes

The following learning outcomes describe the course's intended direction and objectives. The trainer adapts activities, examples and participant work to the group's goals, experience and learning needs.

01 **Hands-On STEM Learning Foundations** - Explain how practical experiments, inquiry and problem-solving activities support learning across science, technology, engineering and mathematics.

02 **Computational Thinking & Introductory Coding** - Apply sequencing, patterns, loops and simple conditional instructions through block-based programming and screen-free activities.

03 **Educational Robotics & Simulation** - Use introductory robotics concepts, digital simulations or available devices to demonstrate movement, control and automated responses.

04 **Scientific Inquiry & Experimentation** - Design practical investigations that encourage observation, prediction, measurement, testing and evidence-based explanations.

05 **Engineering Design & Prototyping** - Apply basic engineering principles to build, test and improve simple models or solutions using accessible materials.

06 **Mathematics & STEM Problem-Solving** - Integrate measurement, coordinates, patterns and logical reasoning into practical STEM challenges and coding activities.

07 **Inclusive & Collaborative STEM Learning** - Adapt STEM activities to diverse learner needs, encouraging teamwork, active participation and different approaches to problem-solving.

08 **STEM Learning Design & Classroom Transfer** - Design, test and assess a practical STEM learning activity, adapting it to available resources, learner needs and educational approaches shared by European peers.

Transfer to practice and intended impact

The programme supports participants in connecting the course learning with their own professional context. Participants consider how relevant approaches, activities or tools could be adapted to their learners, priorities and institutional settings.

1. **Identify a relevant professional need:**
   Consider which learner need, classroom challenge or institutional priority the course learning could help address.
2. **Adapt the approach to your setting:**
   Select the activities, tools or approaches that can realistically be incorporated into your own professional context.
3. **Decide what progress would look like:**
   Consider how changes in practice, learner engagement, learning outcomes or another relevant result could be recognised.

03 / COURSE PROGRAMME | DAYS 1-3

Learning Activities & Training Schedule

SUNDAY / DAY 1

Flexible self-preparation followed by an in person European exchange session, **at 18h30.**

MONDAY - FRIDAY / DAYS 2-6

08:30 - 13h30

5h of training per day · 30h total

This is a typical timetable, subject to the provider's discretion.

DAY 1

Cross-Cultural Exchange, European Educational Context & Course Orientation

- Pre-Session work: Self Preparation to reflect and share your institution's context, cultural background & completion of the Cultural Quiz.
- Welcome, networking and cultural exchange between participants and Erasmus+ team.
- Icebreaking activities and sharing of European core values.
- Open space for participants to share ideas and discuss current challenges in the Education sector; collaborative opportunity to exchange future goals.
- Course briefing and planning.

DAY 2

STEM Education, Inquiry & Hands-On Learning

- Examine the principles of STEM education and the value of practical, inquiry-based learning.
- Compare hands-on teaching approaches across science, technology, engineering and mathematics.
- Test simple experiments and problem-solving tasks using accessible classroom materials.
- Identify a target learner group and define objectives for a practical STEM learning project.

DAY 3

Scientific Investigation & Introductory Robotics

- Investigate how educational robotics can support scientific inquiry, observation and experimentation.
- Practise basic coding concepts through sequencing and block-based programming, using accessible tools such as Scratch.
- Test virtual or available physical robots to understand movement, control and simple responses.
- Design a science-based challenge that combines predictions, observation and practical experimentation.

04 / COURSE PROGRAMME | DAYS 4-6

Learning Activities & Training Schedule

DAY 4

Coding, Sensors & STEM Problem-Solving

- Apply loops, conditions and simple programming sequences to solve introductory STEM challenges.
- Investigate how sensors and programmed instructions can influence robotic behaviour.
- Use virtual robotics tools, such as VEXcode VR, to test movement, obstacle detection and automated responses.
- Develop a collaborative coding challenge, identifying errors and improving solutions through testing.

DAY 5

Engineering Design, Mathematics & Creative Challenges

- Apply basic engineering principles through practical design, construction and testing activities.
- Build and improve simple prototypes using affordable or reusable materials.
- Integrate measurement, coordinates, patterns and mathematical reasoning into STEM challenges.
- Practise collaborative problem-solving through design tasks with clear objectives and constraints.
- Adapt engineering and mathematics activities to different learner needs and classroom resources.

DAY 6

STEM Project Development, Assessment & Classroom Application

- Combine scientific inquiry, coding or engineering into a practical STEM learning activity.
- Define learning objectives, materials, instructions and simple assessment criteria.
- Present and test the activity, refining its accessibility and educational value through structured feedback.
- Complete course reflection, evaluation and Certification.

ADAPTABLE TRAINING

This programme is a planned framework. Specific activities, sequence, exercises and timings may be adapted by the trainer or provider to each group/edition.

COURSE RECORDS

Daily summary and attendance sheets record the schedule and a short account of each day's work, validated by the trainer and signed by the participants.

Edition-specific evidence: Learning Together maintains signed daily training and attendance records. This brochure describes the course framework; additional verification can be based on the records of the particular edition.

05 / LEARNING APPROACH & METHODOLOGY

Learning Together Methodology

Learning Together courses combine guided input supported by presentations and multimedia resources with practical experimentation, creative workshops, case-based learning and hands-on tools. Participants connect the learning to their own professional situations and progressively develop an applied outcome, which may take the form of a presentation, project, session plan, action idea, reflection or another relevant output.

Peer / trainer feedback supports refinement throughout the process, while European exchange encourages participants to compare practices, perspectives and approaches across different educational contexts.

Methods applied in this programme

Hands-On STEM Inquiry & Experimentation

Participants conduct practical investigations using accessible materials, applying observation, prediction, measurement and experimentation to understand scientific and mathematical concepts.

Coding & Robotics Simulation Workshops

Guided activities introduce block-based programming, movement, sensors and logical reasoning through digital simulations, screen-free tasks and available robotics equipment.

Engineering Challenges & STEM Prototyping

Participants design, build and test simple solutions, applying engineering principles and collaborative problem-solving to develop practical, inclusive STEM learning activities.

Collaborative learning, peer exchange and reflection

Participants work with European colleagues, compare professional contexts, exchange approaches and reflect on how the learning can be transferred to their own institutions.

> **Illustrative example: Designing a STEM Navigation Challenge**
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> Imagine a teacher designing a STEM challenge in which learners guide a virtual robot through a simple obstacle course. Participants define movement instructions, apply measurement and coordinate concepts, test different solutions and analyse errors. They then adapt the activity to different ages, learning needs and classroom resources.

An adaptable learning experience

Learning Together courses are delivered by trainers with relevant professional & pedagogical experience, **who are fluent English speakers**. The trainer may vary by edition, adapting the activities to the group's professional context and learning goals.

Meet our trainers and explore our approach

06 / PRACTICAL INFORMATION & SUPPORT

Everything you need for your training

Your course materials and participant work

Participants receive access to course materials, including slides, presentations, worksheets and exercises made available for the sessions, through a dedicated online folder.

Depending on the activities, groups may also develop action plans or presentations. The output varies with the programme, trainer and group.

Materials to bring: Laptop

Course package

Includes training sessions, digital materials, practical resources, administration and course-week support, welcome kit, coffee breaks and course documentation. Cultural activities and an orientation session **depend on the edition selected** (flights, accommodation & other personal arrangements are not covered).

Check fees and inclusions for your selected course.

Documents & certification

We issue Certificate of Attendance, invoice and support agreed Erasmus+ mobility documents, including Europass Mobility records. Certificate issuance follows the attendance conditions.

Send any additional school forms to our team in advance. Explore document guidance.

Provider & quality

Learning Together operates through registered organisations in every country where services are provided, each with its own Erasmus+ Organisation ID (OID). Our programmes combine clearly defined learning outcomes, participatory methodologies and practical activities, with participant evaluation & feedback at the end of the training.

Provider OIDs: Portugal E10201112 · **Spain** E10417947 · **Poland** E10419682

FROM INTEREST TO A CONFIRMED BOOKING

01
Pre-enrol

Share your course & preferred dates. Pre-enrolment is non-binding; wait for written confirmation before making non-refundable travel bookings.

02
Confirm your place

Our team will confirm availability by email. Complete final enrolment and billing details to secure your place.

03
Plan your travel

Once your booking is confirmed, you can plan your travel. Before travelling, check materials required, timetable and activities in your selected edition.

YOUR NEXT STEP

Ready to plan your course?

Check the current dates, duration, fee and edition status on the course page, then start your pre-enrolment or contact us!

View course & editions ↗ | Pre-enrol ↗

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