



**NEW!**



# SCIENCE EDUCATION HANDS-ON CLASSROOM



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**OID: E10201112**



Advanced Institute for Skills Development

# COURSE DESCRIPTION

This is a dynamic professional development course designed for educators seeking to revolutionize their science teaching methodologies. This course emphasizes the crucial role of hands-on experiments, innovative teaching strategies, and the integration of ICT to enhance student engagement and learning outcomes in the sciences:

- **Interactive Learning:** Engage with a range of hands-on activities that transform abstract scientific concepts into tangible learning experiences.
- **Integration of ICT:** Learn to effectively incorporate digital tools such as PhET Interactive Simulations and ChemCollective into your teaching practices to enrich the educational experience and cater to diverse learning styles.
- **Focus on Innovation:** Drawing inspiration from educational pioneers like John Dewey and Jean Piaget, the course delves into active learning and inquiry-based teaching methodologies that stimulate critical thinking and problem-solving skills.
- **Experiential Teaching Techniques:** Master the art of teaching through experiments using easily accessible materials and innovative classroom resources to keep students captivated and actively involved in their learning journey, as well as gamification.
- **Professional Collaboration:** Participate in collaborative workshops and discussions to refine teaching practices and develop a supportive network of like-minded professionals.

## Course Objectives

By the end of this course, participants will not only gain a deeper understanding of essential pedagogical strategies but also develop the confidence to implement an interactive, student-centered learning environment in their own classrooms. Educators will leave with a toolkit of resources, a network of peers for ongoing support, and the motivation to inspire students to love and excel in science.

# COURSE INFORMATION

## Learning Outcomes

The course's objective is to equip educators with practical skills and innovative approaches to foster an active learning environment where students can explore and understand scientific concepts through direct experimentation and inquiry.

- Understand the importance of igniting scientific curiosity through the work of globally renowned scientists like Marie Curie and Neil deGrasse Tyson, enabling teachers to project curiosity as a central element in scientific advancement.
- Master experimental teaching strategies through practical, research-based pedagogical methods, including those proposed by John Dewey and Jean Piaget's Principles of Active Learning.
- Integrate technology into science education by utilizing digital learning tools such as PhET Interactive Simulations for physics and ChemCollective for chemistry.
- Develop critical thinking skills using methods endorsed by Edward de Bono, to foster student analysis and questioning.
- Create engaging lesson plans that incorporate STEAM (Science, Technology, Engineering, Arts, and Mathematics) methodologies for more enriched and interdisciplinary classes.
- Facilitate experience and cultural exchanges between European participants and teaching personnel, which results in a fruitful international experience;
- Enhance communicative competencies in English and social skills;
- Promote intercultural awareness;
- Develop ICT skills;
- Identify and share good practices that can be implemented at a local level.

# DAILY PROGRAM

Our courses also include  
a daily Coffee Break  
throughout the week

## DAY 1 / 18h30

- Introduction to the course and the significance of scientific curiosity.
- Interactive discussions on the history of major scientific discoveries using a scientific discovery timeline.
- Group activities based on the “Case Study” method to explore significant scientific events, promoting analysis and debate.
- Analysis of current case studies through TED Talks and newspaper articles, illustrating how curiosity continues to drive modern science.

## DAY 2 / 8h30-13h30

- Overview of research-based teaching methods and how to integrate these strategies into science subjects.
- Creation of accessible experiments using Hands-On Science kits, facilitating learning through experimentation.
- Implementation of feedback and Peer Instruction techniques to evaluate the effectiveness of experiments and encourage peer discussion.

## DAY 3 / 8h30-13h30

- Training in digital simulations with tools like PhET and ChemCollective.
- Hands-on workshops on using these platforms to simulate physical and chemical experiments.
- Development of interactive projects with tools like Arduino and Raspberry Pi, using electronics kits and programming to create projects demonstrating scientific principles.

## DAY 4 / 8h30-13h30

- Structured debates on controversial scientific topics using the Oxford debate format.
- Activities challenging students to apply critical thinking to complex problems using scientific puzzles and detailed case studies.
- Design of STEAM lesson plans integrating various disciplines using the Design Thinking framework.
- Introduction to gamification techniques to enhance student engagement, including the use of platforms like Classcraft.
- Techniques of critical questioning, teaching students to deepen understanding and reasoning.

## DAY 5 / 8h30-13h30

- Introduction to gamification techniques to enhance student engagement, including the use of platforms like Classcraft.
- 360 Degree Feedback forms for evaluation & feedback.
- Final debate on strategies to motivate students towards sciences.
- Course roundup & review.
- Learning outcomes' validation.
- Certification Ceremony.

\*This schedule/ program describes likely activities but may differ based on the trainer's discretion and objectives.



# OTHER DETAILS

**Certification:** Certificate of Attendance + description of the previous learning outcomes; Europass validation

(Our courses are eligible to be completely funded by the new Erasmus+ program 2021-2027 - KA1 funds and several other programs)

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