

HANDS-ON LEARNING IN STEM (MBOT)



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OID: E10201112

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COURSE DESCRIPTION

This course targets school teachers/trainers, aiming to assist them in incorporating mBot across various subject areas, including mathematics, physics, biology, and more.

mBot is a STEAM education robot for beginners, that makes teaching and learning robot programming simple and fun. With just a screwdriver, step-by-step instructions, and a study schedule, children can build a robot from scratch and experience the joys of hands-on creation.

Participants will learn about a variety of robotic machinery and electronic parts, get to grips with the fundamentals of block-based programming, and develop their logical thinking and design skills.

The mBot isn't just another robotic toy—it's an affordable, build-it-yourself creation intended to impart several technical skills to children. While it may not teach them how to craft a website or an app, it lays a solid foundation in the fundamental principles of development. What makes it unique is its ability to engage learners through interactive stories in its training guides. Employing real-world contexts simplifies complex concepts, offering instant gratification for the efforts invested.

The platform's brilliance lies in applying these concepts to the robot itself. By plotting characters on a coordinate plane and manipulating their movements through the X and Y axes, children can observe similar principles applied to the mBot. Introducing sensors further illuminates the power of automation.

mBot serves as an excellent vehicle for teaching programming fundamentals in an enjoyable and easily comprehensible setting. It excels at laying the groundwork for understanding core development competencies.

The mBot stands as an introductory educational robot kit aimed at initiating students into the world of programming, electronics, and robotics through hands-on experiences. With the mBot, students have the opportunity to assemble the robot in diverse ways, utilizing various pre-assembled options available. These include configurations like an obstacle-avoidance car, a line-following vehicle, and a remote-controlled car, providing a range of practical learning opportunities.

COURSE INFORMATION

Learning Outcomes

- Explain the Significance of Hands-On Learning in STEM Education;
- Articulate the importance of hands-on learning in enhancing student engagement and understanding across STEM disciplines;
- Develop hands-on learning activities tailored to science, technology, engineering, and mathematics, incorporating the mBot platform;
- Effectively integrate mBot technology into diverse STEM lessons, demonstrating proficiency in programming and utilizing mBot functionalities;
- Apply engineering principles and design thinking methodologies while utilizing mBot to solve problems and create innovative solutions;
- Create innovative STEM projects using the mBot platform that encourages critical thinking, collaboration, and experimentation;
- Devise plans to seamlessly integrate mBot-enhanced learning experiences into existing curriculum structures across various educational settings;
- Engage in collaborative discussions, sharing experiences and best practices for implementing mBot in STEM education, fostering a community of practice among educators;
- Enhance communication skills and the English language;
- Enhance digital skills;
- Share European common values.

These objectives and learning outcomes aim to equip educators with the necessary knowledge, skills, and strategies to effectively utilize the mBot platform for enhancing hands-on learning experiences in STEM subjects.

DAILY PROGRAM

Our course also include a daily Coffee Break & Social Program Activities

DAY 1 / 18h30

- Welcome Session: dinner, icebreaking
- Meet & greet, networking between participants and LT staff
- Week briefing & planning

DAY 2 / 8h30-13h30

- Introduction to STEM Education and Hands-On Learning
- Overview of STEM Education: Goals and Significance
- Understanding the Role of Hands-On Learning in STEM
- Exploring Successful Models of Hands-On Learning in STEM Education

DAY 3 / 8h30-13h30

- Hands-on learning in Science Education with mBot
- Introduction to mBot: Overview and Basic Functionality
- Hands-On mBot Programming for Science Applications
- Designing Science Experiments Using mBot

DAY 4 / 8h30-13h30

- Technology Integration with mBot in STEM Learning
- Advanced mBot Programming: Exploring Sensors and Applications
- Collaborative Design Challenge: Developing mBot Projects for STEM
- Hands-On Work: Integrating mBot Technology into STEM Activities

DAY 5 / 8h30-13h30

- Engineering Applications and mBot Projects
- Engineering Concepts with mBot: Building and Prototyping
- Design Thinking Workshop: Problem-Solving with mBot
- Hands-On Engineering Challenges with mBot
- Applying Engineering Principles with mBot Projects
- Mathematics and Problem-Solving with mBot
- Interactive Programming: mBot for Math Challenges

DAY 6 / 8h30-13h30

- Implementation and Reflection
- Recap and Reflection: Insights from Hands-On mBot Learning
- Strategies for Integrating mBot-Enhanced STEM Learning into Curriculum
- Group Presentations: Showcasing mBot-Integrated Lesson Plans and Projects
- Course roundup & review
- Learning outcomes' validation
- Certification Ceremony



ADDITIONAL INFORMATION

Certification: Certificate of Attendance and description of learning outcomes; Europass validation

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

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