



TOT Program

Course Syllabus

Course Title: Integrating MIT App Inventor and Artificial Intelligence in STEM Education for Teachers

Prerequisites: none

Credit hours: 10

Target audience: Trainers and Teachers

Course Description:

This training course aims to empower teachers to design and develop interactive educational applications using MIT App Inventor within the framework of the STEM approach, with a focus on the pedagogical integration of programming and Artificial Intelligence (AI) in education.

The course provides participants with both theoretical knowledge and practical skills necessary to develop simple educational applications that support school curricula, promote project-based learning, problem solving, and computational thinking.

The course is delivered through hands-on, practice-oriented training, targeting the development of teachers' technical and instructional competencies in line with the demands of modern digital education.

Core Course Modules (10 Training Hours)

The Content	Duration (hour)
<p>Module 1: Introduction to STEM and Digital Education</p> <ul style="list-style-type: none">• Concept and importance of the STEM approach in contemporary education.• The role of programming and educational applications in supporting STEM learning.• Introduction to computational thinking and project-based learning.	1
<p>Module 2: Introduction to MIT App Inventor Platform</p> <ul style="list-style-type: none">• Overview of the MIT App Inventor environment and its components.• Designing user interfaces for educational applications.• Working with essential application components.	3
<p>Module 3: Block-Based Programming Using App Inventor (2 hours)</p> <ul style="list-style-type: none">• Fundamentals of block-based programming.• Variables, events, conditions, and loops.• Linking programming concepts to STEM curriculum content.	3
<p>Module 4: Designing STEM-Based Educational Applications (2 hours)</p> <ul style="list-style-type: none">• Translating learning objectives into digital applications.• Designing problem-based and project-based learning activities.• Sample educational applications in science, mathematics, and technology.	1

Module 5: Integrating Artificial Intelligence in Educational Applications	2
<ul style="list-style-type: none"> • Introduction to Artificial Intelligence in education. • Practical applications of AI tools within MIT App Inventor. • Examples of using AI to enhance interaction and intelligent learning. 	

Learning Objectives By the end of this course, trainees will:

- Explain the concepts of STEM education and computational thinking and their role in teaching and learning.
- Use the MIT App Inventor platform to design educational application interfaces.
- Develop simple educational applications using block-based programming.
- Integrate programming to support STEM subjects in classroom instruction.
- Design project-based learning activities using educational applications.
- Integrate selected Artificial Intelligence applications into educational app development.
- Apply innovative instructional strategies that promote active and interactive learning.
- Evaluate the effectiveness of educational applications in achieving learning objectives.