TOT Program

Course Syllabus

Course Title: **SPIKE PRIME Robotics – Python coding**

Prerequisites: **Basics of python and spike prime block-based environment**

Credit hours: **12**

Target audience: **Trainers and Teachers**

Course Description:

This is a TOT course meant for trainers who are interested in teaching and training the cutting-edge LEGO Robotics platform (SPIKE PRIME) which is the substitute for the EV3 platform. Trainees are going to step up their coding skills by getting specialized hands-on training based on python language to program spike robots. Starting from the design issues such as (building-pieces uses, movement systems, structuring robots' bases ...etc.), passing by the electronic components and their uses, coding skills, and not ending with a lot of implementations and practical applications.

The Content	Duration (hour)
Subject 1: The work space & technical Jargon • Module • Routine • Coroutine • Coding mechanisms **Subject 2: Static import** • Mechanisms • Troubleshooting import issues • Hierarchal structure of modules and methods **Subject 3: Utilizing The Hub** • Modules, submodules, and methods in use • Implementations **Subject 3: Conditional and looping Statements** • Modules, submodules, and methods in use • Conditional statements in action • Implementations **Subject 4: Straight movement & Relative position** • Modules, submodules, and methods in use • Synchronous(p) commands vs Asynchronous(a) commands • Asynchronous commands stategy1 • Implementations • Building Custom Functions **Subject 5: Rotation around the z-axis** • Motion (gyro) sensor • Modules, submodules, and methods in use • Constant Motor-speed technique • Implementations **Subject 6: Sensors Operation** • The Force sensor • The Distance sensor • The Color sensor • Modules, submodules, and methods in use • Implementations	**12**

Course Requirements:

1. Laptop
2. Spike Prime robotics core Kit

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

1. **Knowledge and Understanding**

   A. Understand the basics and fundamentals of text-based coding through python language.
   B. Deeply, understand the required programming skills to use in practical implementations such as programming a robot.
   C. Comprehend the framework of writing a "clean" functional piece of code.

2. **Skills and capabilities:**

   A. Write simple to mid-levelled pieces of code.
   B. Use many programmatic commands and programming skills to control and program spike prime robots to perform various missions.
   C. Develop and effectively employ the skill of problem-solving, to find different programmatic solutions, many of thinking approaches as well.
   D. Acquire and develop a bunch of relevant engineering skills and practices.