

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)
<p>Subject 1: The work space & technical Jargon</p> <ul style="list-style-type: none"> • Module • Routine • Coroutine • Coding mechanisms <p>Subject 2: Static import</p> <ul style="list-style-type: none"> • Mechanisms • Troubleshooting import issues • Hierarchical structure of modules and methods <p>Subject 3: Utilizing The Hub</p> <ul style="list-style-type: none"> • Modules, submodules, and methods in use • Implementations <p>Subject 3: Conditional and looping Statements</p> <ul style="list-style-type: none"> • Modules, submodules, and methods in use • Conditional statements in action • Implementations <p>Subject 4: Straight movement & Relative position</p> <ul style="list-style-type: none"> • Modules, submodules, and methods in use • Synchronous(p) commands vs Asynchronous(a) commands • Asynchronous commands strategy1 • Implementations • Building Custom Functions <p>Subject 5: Rotation around the z-axis</p> <ul style="list-style-type: none"> • Motion (gyro) sensor • Modules, submodules, and methods in use • Constant Motor-speed technique • Implementations <p>Subject 6: Sensors Operation</p> <ul style="list-style-type: none"> • The Force sensor • The Distance sensor • The Color sensor • Modules, submodules, and methods in use • Implementations 	<p>12</p>

Course Requirements:

1. Laptop
2. Spike Prime robotics core Kit

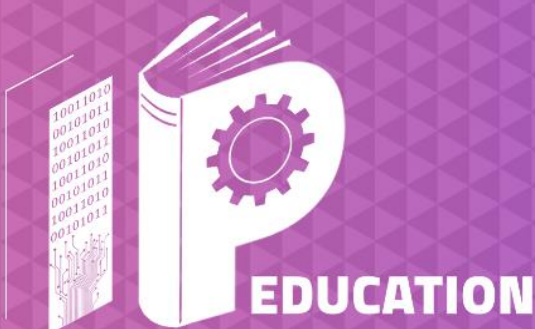
Learning Objectives: By the end of this course, trainees will:

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.



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