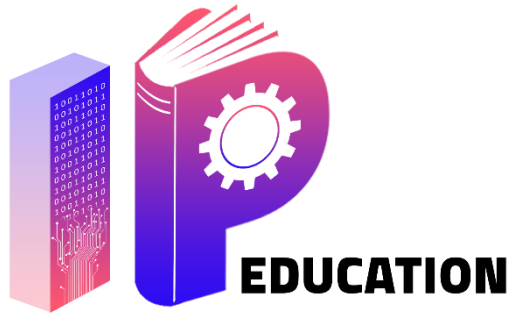




TOT Program

Course Syllabus

Course Title: SPIKE PRIME Robotics – Foundational

Prerequisites: none

Credit hours: 18

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 get specialized hands-on training based on the educational policy "STEM". Starting from the design issues such as (building-pieces uses, movement systems, structuring robots' bases ...etc.), passing by the electronic components and their uses, and not ending with coding skills (movement, variables, conditional statements, P-controller, etc.). As well as, trainers are going to assimilate sophisticated skills and concepts, all forehead mentioned will be delivered within a framework of implementations and practical applications.

The Content	Duration (hour)
Programming Approach Subject 1: Straight Movement, Rotation and Steering • Mechanisms • Categories and Blocks in use • Implementations Subject 2: Conditional statements & Functions • Working principles and mechanisms • Blocks in use • Implementations Subject 3: Force, Distance, Color, and Motor rotation Sensors • Working principles and mechanisms • Blocks in use • Conditional statements in action • Implementations Subject 4: Parallel Commands and Events • Multi-thread code • Broadcasting • Blocks in use • Implementations Subject 5: Utilizing Variables • The principle of variables in coding • Blocks in use • Implementations Subject 6: P – Controller • The definition and mathematical body • Blocks in use • Implementations	10

Design Approach	8
Subject 1: Robot Design I • SPIKE PRIME core set • The structural pieces • Basics of building wheeled mobile robots • Implementations Subject 2 : Robot Design II • Gear systems - basics • Essentials of transmission systems – basics • Arms and lifts design – basics • Building SpikeRobo1 • Implementations Subject 3: Robot design III • Interior and exterior structures • Weight distribution and similarity • Wheel-effect • Implementations Subject 4: Robot Arm Motion Control • The mechanism of moving arms and lifts • Blocks in use • Implementations	

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 functionalities of the components of the kit such as electronic parts and building parts.
- B. Deeply, understand the required programmatic commands for essentials of robot functionalities.
- C. Comprehend the basic to upper intermediate skills and concepts of mobile Spike robots mechanical design of robots such as vehicles and tanks.

2. Skills and capabilities:

- A. Design and build different mobile robots.
- B. Use many programmatic commands and programming skills to control and program mobile robots to perform various missions.
- C. Develop and effectively employ the skill of problem-solving, to find different solutions in terms of robots design and programming, many of their soft skills and thinking approaches as well.
- D. Recognize and use the basics of programming and designing Spike robots which qualifies them to step up into more advanced courses.
- E. Acquire and develop a bunch of relevant engineering skills and practices.



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