HobbyEL-01

Lessons: 30   Modules: 6   Duration: 50-60 Hours

Certificate Levels

Hobbyist Enthusiast: Modules 1,2 3
Hobbyist Master: Hobbyist Enthusiast + Modules 4 & 5
Hobbyist Proficient: Modules 1 through 6

Module 1: Programming Environment

Lesson 1: Intro to Embedded Systems.
Lesson 2: Arduino programming environment.
Lesson 3: Task 1: Logic, Math & waveforms.
Lesson 4: Task 2: I/Os & debugging.
Lesson 5: Task 3: Basic Switch & LED I/F.

Module 2: Interfacing Components 1

Lesson 1: Sensors, Actuators, V & I level.
Lesson 2: Scaling & Conversion - POT i/f.
Lesson 3: Task 1: Simple LED control.
Lesson 4: Task 2: Handling higher V & I.
Lesson 5: Task 3: I2C, RS232, SPI Comm.

Module 3: Interfacing Components 2

Lesson 1: Interfacing I2C Display: Using Lib.
Lesson 2: Creating graphics on display.
Lesson 3: Interfacing other sensors.
Lesson 4: DC Motor Control & H-Bridge.
Lesson 5: Rate monotonic scheduling.

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Module 4: Interfacing Components 3

Lesson 1: Interfacing advanced sensors.
Lesson 2: Compass, Gyro, Accelerometer.
Lesson 3: Stepper Motor.
Lesson 4: Ultrasound, IR sensor.
Lesson 5: Rate monotonic scheduling.

Module 5: Project: OreC.A.R. P-I

Lesson 1: Requirements & Breakdown.
Lesson 2: System Design & Architecture.
Lesson 3: Design & Intro to PC app.
Lesson 4: Design & simple PC program.
Lesson 5: Design & integrating PC app.
Lesson 6: Hands on mechanical build.

Module 6: Project: OreC.A.R. P-II

Lesson 1: Design & PC app debugging.
Lesson 2: Design & Integration.
Lesson 3: Testing
Lesson 4: Tweaking & Testing
Lesson 5: Demo

Terms & Notes: Each lesson is approx. 1.5 to 2hrs. Additional practice lessons could be provided if needed. Participants are encouraged to spend time on their own. A few kits are available to checkout along with some components. Lab facility could be used at specific times depending on instructor's availability. The cost is per module basis & it is $120 per module. Modules 4, 5 & 6 are optional although we recommend to take them to have a full learning experience. All hardware, tools will be provided during the class. **Note:** Although PCs will be provided during the class, participants are encouraged to bring their own laptops so they can practice at home. The courses will be based on Arduino development boards. RP development boards & Python programming will be offered later along with AI/ML and advanced applications such as controls, IoT etc. The cost is per person per month. A family or siblings discount can be discussed. Fees to be paid at the beginning of the month and is non-refundable and non-transferable. Participants can withdraw any time without pro-rated fees.

At a very reasonable price of $120 per module.