

The explosive growth in the EV industry has created a shortfall of trained engineers with practical design abilities in EV systems.

Makxenia Product School's *Certification Course in Electric Vehicle Power Electronics* is a blend of hands-on projects along with theoretical sessions focused on fundamentals to learn practical design and prototyping skills. The course includes sessions with EV industry experts. All required electronics tools and components will be provided to attendees. Participants will gain in-demand design skills which will let them hit the ground running in the EV industry.

Who can join: Engineering undergrads and fresh graduates

Internship Opportunity: Candidates successfully completing the course will be given priority for 4 to 6 month internships at an EV startup based in Bangalore. The internships will let you work with EV designers and experts on ongoing EV projects, and come with benefits of free accommodation, food and medical expenses.

Course Duration: 1 month (20 hrs theory; 30 hrs hands-on projects)

Course Starts: Jan 15th, 2022

Internship Interviews: Interview dates will be unlocked on successful completion of the course.

Time: 8 AM to 10 AM | 6PM to 8 PM

Venue: Nagpur

Registration Link:

Book a guided consultation slot: 8055405647, 8208302266

List of Hands-on Projects:

- Led Blink
- Led GLow
- Led Pattern
- Led Running
- Switch interface

- Switch to Serial
- Switch to LED control
- Keyboard controlled LEDs
- Transistor as a Switch
- Motor control using H Bridge
- Motor control using Arduino
- Keyboard controlled motor
- Led brightness control
- Motor speed control
- Mosfet as switch P channel and N channel
- Motor control using MOSFET
- Building ESC to control BLDC using MOSFET
- LT Spice Simulation of BLDC driver

Course Curriculum:

- Session 1:
 - Introduction to Electric Vehicle
 - Electric Vehicle Architecture
 - Engineering and Financial Viability Analysis of EV's as of 2022
 - Electric Vehicle parts and its working
- Session 2:
 - Introduction to Embedded System
 - Microcontroller and Microprocessor history
 - Introduction to Atmel Atmega328
- Session 3:
 - Arduino and Arduino IDE installation
 - Digital Output

- LED blink
- Introduction to C
- LED glow
- LED pattern generation
- Session 4:
 - Digital Input
 - Mechanical switch types
 - Switch interfacing
 - Switch to Serial +
 - Switch to LED
- Session 5:
 - Serial experiments
 - Keyboard controlled LEDs
- Session 6:
 - Motor basics and types
 - Introduction to switching devices in electronics
 - Need for Power Electronics
 - Types and of switching devices
- Session 7:
 - H-Bridge, Back EMF
 - Fundamentals of Transistor
 - Transistor as a switch NPN - PNP
 - Datasheet of BC548(NPN) and BC558(PNP)
- Session 8:
 - Transistor ratings, characteristics
 - Darlington pair
 - Custom H Bridge design

- Motor Control using H Bridge
- Session 9:
L293D Motor Driver
- Motor Control using Arduino
- Differential Drive, Keyboard controlled motor
Revision, Assignment discussions, Doubt clearing sessions
- Session 10:
 - Pulse Width Modulation PWM
 - LED Brightness control
 - Motor Speed control
 - Revision, Assignment discussions, Doubt clearing sessions
- Session 11:
 - MOSFET -
 - Fundamentals of Mosfet
 - MOSFET as a switch P - channel and N - channel
 - Datasheet of MOSFET IRF540 and IRF9540
- Session 12:
 - Motor control using MOSFET H-Bridge
 - Introduction to BLDC motor
- Session 13:
 - Electronics Speed Controller
 - MOSFET Driver
 - Building ESC to control BLDC using MOSFET
 - Revision, Assignment discussions, Doubt clearing sessions
- Session 14:
 - LT Spice Simulation of BLDC driver
- Session 15:
 - DC DC Converters fundamentals and working

- Buck Design
- DC DC Buck Converter 12V to 5V Schematic
- Session 15:
 - Boost design
 - DC DC Boost converter 12V to 24V schematic
 - DC DC Boost Converter 12V to 24V implementation on breadboard
- Session 16:
 - LT Spice Simulation of DC DC boost
 - Revision, Assignment discussions, Doubt clearing sessions
- Session 17:
 - Future Scope, Shortlisting Test