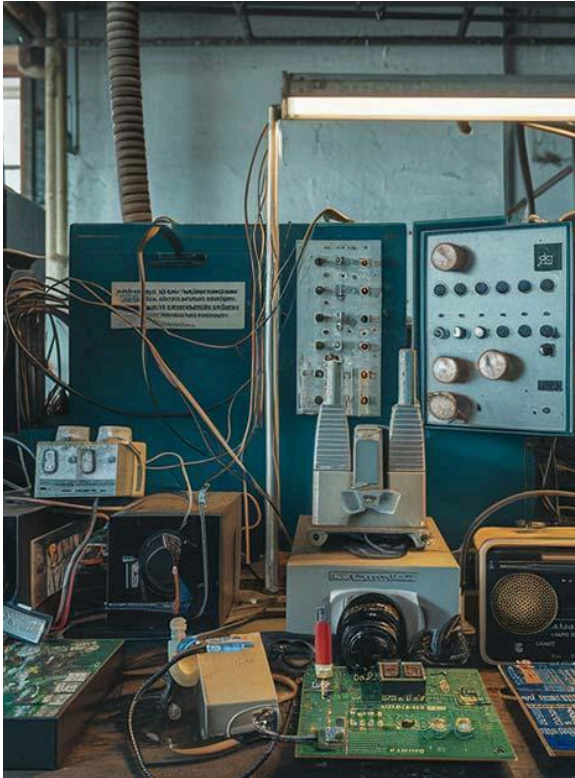


Job Oriented Course on Industrial Electronics Product Development -IEPD



Highlights

- ★ Industry relevant course content
- ★ Trainers will active R&D professionals
- ★ Get live experience on industrial projects
- ★ Industrial internship
- ★ Industry visits
- ★ Learn latest Industry tools and technology
- ★ Access to laboratory, apparatus, tools
- ★ Application based projects
- ★ Certification
- ★ Perfect blend of hands-on projects with knowledge-based theory

Eligibility criteria

- Final-year students or graduates in B.Tech/M.Tech (Electronics Engineering)
- Admission via enrollment test and interview

Program Structure

- Duration: 7 months
- 4 Months Training
- 3 Months internship on live industry project
- 5 hrs per day (theory + practical)
- Modes: in-Person at Makxenia facility
- Placement assistance
- 10 Seats Per Batch
- Jul 2025 – Jan 2026 Session
- Start Date: July 15th, 2025
- Time: 11AM - 5:00 PM
- Assignments and Monthly Test

Four Highly Integrated Modules

Month 1—

- C Programming Basics
- Applied electronics
- Microcontroller 1 - Atmega328
- Embedded C programming

Month 2—

- Microcontroller 2 - ESP32 with Wi-Fi & BLE
- Internet of Things IoT
- Microcontroller 3 - STM32F103- 32-bit Arm
- Bare metal programming

Month 3—

- PCB Designing with Kicad
- CAD designing with Fusion360
- 3D printing - FDM based
- Microcontroller based product development

Month 4—

- Raspberry Pi- single board processor
- Linux operating system
- Python for embedded systems
- Image Processing based product development

Course Content

Month 1:

Embedded C with Atmega328

History of Programming

VS Code IDE

Build process of a program

Basics revision

- Data Types
- Conditional Statements
- Loops

Library & Functions

Array and Pointers

Memory Management

Version Control and Github

Good programming practices

Applied Electronics

History of Electronics

Tools for electronics development

Practical Implementation of

- Resistor
- Capacitors
- Inductors
- Diodes
- Transistors
- Mosfets

Through hole vs SMT

Component Value Selection

Circuit Conceptualisation

Circuit Implementation

Soldering and Desoldering

Circuit Debugging

Atmega328 Microcontroller

Microcontroller vs Microprocessor

Atmel Microcontroller Ecosystem

Arduino and its IDE

Software installation

Project Structure in Arduino IDE

Build: LED blink, C Revision, LED Glow,

8 bit PWM and LED Brightness Control

Digital Read Write Analog Read write

Serial Communication and Serial Monitor

Serial Commands

Switch interfacing, Switch to Serial, Embedded C

Install PlatformIO extension on VS Code

Embedded C Programming

PlatformIO vs Arduino IDE

Installing Libraries in PlatformIO

Git and version control

Project Structure

IR sensor Basics

Motor and motor control

Keyboard controller robot

Line follower robot

ADC 10 bit- light controlled LED

I2C protocol

SPI protocol

RS232 Protocol

RS485 ModBus Protocol

Month 2:

ESP32 - 32 bit

History of Espressif

Introduction to ESP32 SoC and Features

Installing ESP32 SDK on Arduino

Blinking LED on ESP32

16 Bit PWM

12Bit ADC

I2C protocol

SPI protocol

CAN Bus Protocol

DHT11 Interfacing to ESP32

VS Code setup for ESP32

Bluetooth Classic

Bluetooth Low Energy

Android App Controlled Robot

BLE Beacon

Internet of Things - IoT

Connecting to Wi-Fi

IP Protocol

HTTP Protocols

- HTTP Post
- HTTP Get

Posting Data to Webserver using ESP32

Receiving Data from Website and Controlling Relays

Basic Wi-Fi Functionality – Wi-Fi Client and Server

Thingspeak Channel Setup Website Hosting

ESP32 Sleep modes

OTA with ESP32

STM32F103RBT6 arm controller

STM32Cube IDE setup
Peripheral setup in CUBEIDE
GPIO Setting
LED Blinking and Switch Interfacing
16 Bit PWM
12Bit ADC
DMA
STM32 HAL Library

Bare metal programming

Number System Binary & Hexadecimal
Bitwise operations
Reading Datasheets and User manuals
Understanding Registers
LED Blink using Bare metal
Efficiency of Bare metal
LED Blink using HAL
ADC using HAL
UART Protocol
SPI Protocol
I2C Protocol
CANBUS Protocol

Month 3:

PCB CAD Designing

Kicad v9 Installation
SchematicDesign
Layout Design
Component Footprint Design
Design Rule Check
Gerber file generation
Fabrication process
Soldering and Assembly

3D CAD Design

3D Computer Aid Design Principal
Fusion360 Installation
Component Design
Assembly Design

3D Printing – FDM

3D Printer Types and Working
Splicing Software
How to use a 3D printer
Post Processing

Product development based on a microcontroller

Design a product for the given problem statement
Use microcontroller
Develop modular functional prototype
Design PCB for product
Design Enclosure for product
Fabricate PCB by etching
Print Enclosure with 3D printer
Assembly and Testing of product
Documentation

Month 4:

Raspberry Pi - SBC

Single Board Computers
SBC available in Market
RPI History
Raspberry Pi 5 Setup
Noobs Installation
Raspberry Pi Remote Access
GPIO Control
PWM

Linux Operating System

Introduction
Linux Distributions
Linux terminal
Commands and file structure
Navigation and file management
Package management
Network Setup

Python Programming

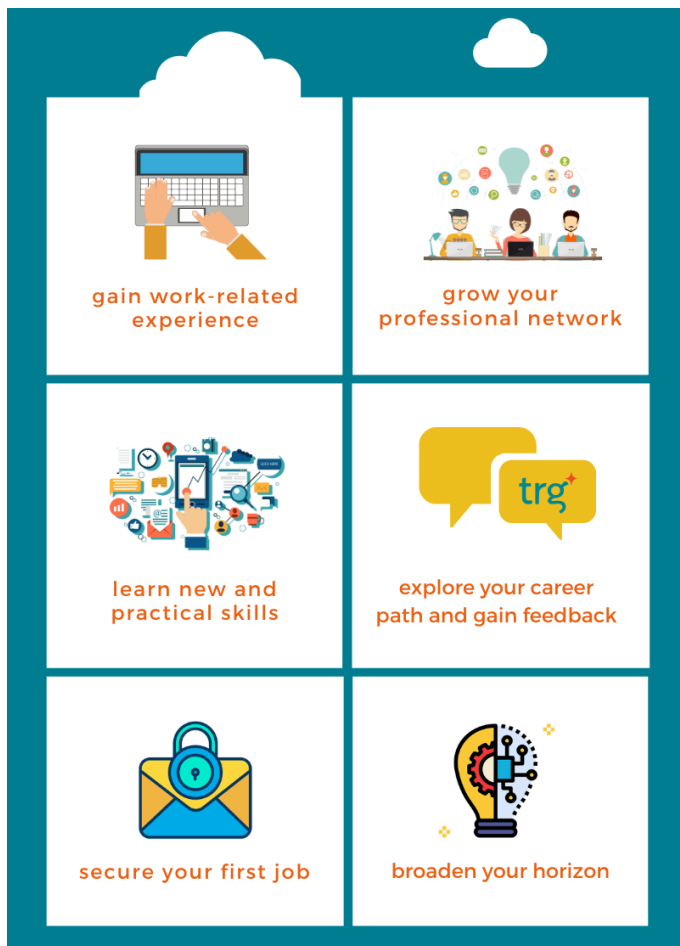
General syntax of Python Programming
Python Programs
Raspberry PI Implementation of IoT with Python
GUI Design with Python using Tkinter
GUI Controlled Robot

Image processing-based product using Raspberry Pi

Image Processing Concepts
interfacing Camera and Setup
Open CV Library
Basic Image Manipulation
conceptualize architecture for the given product
Develop Firmware
Design Enclosure for product
Print Enclosure with 3D printer
Assembly and Testing of product
Documentation

Month 5 to 7:

Internship on actual industrial projects
Work with R&D professionals as assistance
Day to day operation of company
Electronics product development life cycle
Purchase, inventory, production process
SMT Pick Place Machine operation
Implementation of concepts learned during training
Graduate with 3 Months Internship Certificate

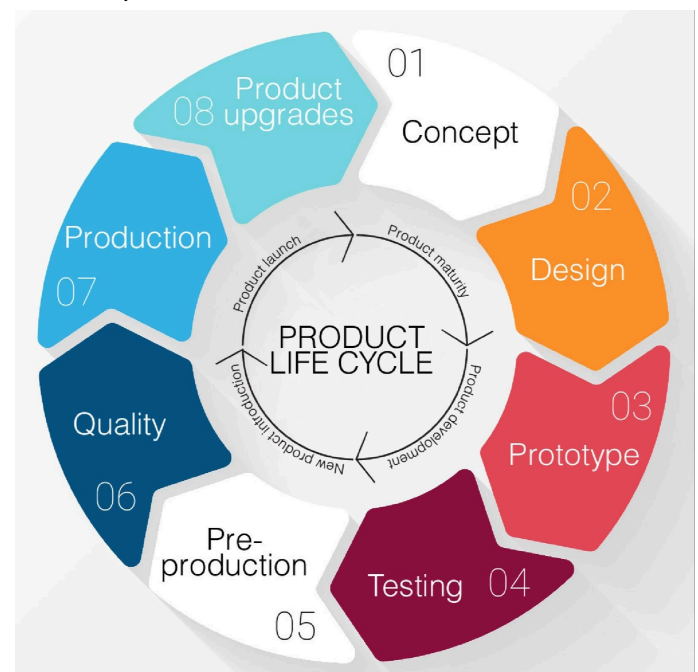


About Makxenia

Makxenia is a research and development firm specializing in electronics and embedded systems, with active work in the automotive, health tech, and mining sectors. In addition to its R&D initiatives, Makxenia offers independent courses and collaborates with academic institutions to bridge the gap between industry and academia.

Outcome

- IEPD is a highly personalized program designed to fast track your career by addressing your industrial leadership and technical expertise objectives.
- The program will help you become what any hardware core industry is looking for.
- Learn full product lifecycle: Concept → Design → Fabrication → Testing
- Designing Box-Build Product from Scratch. Learning product conceptualization, Architecture design, PCB Designing and fabrication, Soldering, 3D CAD to design enclosure and 3D printing.
- Transition from controller to a 64-bit Arm based Single board computer RPi to enrich the capability of the embedded system and incorporate the power of the operating system.



Contact

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