

**Foundation Course Embedded Level -2****Course Module**

- Course Name: **Skill Foundation in Embedded Level -2**
- Who Can Join: Pursuing 3rd Year B. Tech and M. Tech & M. Sc -1<sup>st</sup> Year
- **The Institute has full right to select the modules as per the requirement of the industry and also depend on the duration of the batch without affecting the course fees.**
- **Certification test is mandatory to attend to award the certificate.**
- **Internship will offer only to the performers or those who completed the industry project.**
  - **Embedded C @ Rs 2950**
  - **Interface with peripherals @ Rs 2950**
  - **RC & Network @Rs 2950**
  - **C++ Programming @ Rs 2950**
  - **PCB Design @ Rs 2950**

Total Fees for Level 2 @ Rs 14750

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**Important Note: - If a trainee is joining in the 3rd Year, they must first complete Level 1 before progressing to Level 2.**

**1. Module 1- Embedded C**

- Basics & Why C in Embedded
- ANSI Standard and Datatypes and Constants
- Simple & Formatted I/O & Memory Usage
- Operators & Expressions
- Flow Control & Loops
- Functions & Recursive Functions
- Call Back Functions & Implications on Stack
- Library vs. User defined function
- Storage Classes & Scope and Life
- Automatic, Static, External, Register
- Memory (CPU / RAM)
- Dynamic Memory Allocation
- Malloc (), Calloc (), Realloc (), Free ()
- Farmalloc (), Farcalloc ()

**2. Module 2 – Interfacing with peripherals**

- ADC
- DMA
- I2C
- SPI
- Latch Interconnections
- Sensors
- Stepping Motors
- Memories

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**Development Boards: Renesas or STM**

The Internship Project will be awarded from Aujus Technology based on above Interfaces, depending on the performance and ability to finish the project in time.

**3. Module 3- Object Oriented Programming with C++**

- ✓ Overview
- ✓ Characteristics
- ✓ Function Overloading
- ✓ Scope Resolution Operator
- ✓ Classes in C++
- ✓ Access Specifiers
- ✓ Constructor, Destructor
- ✓ Static members, Functions
- ✓ Friend Classes, Friend Functions
- ✓ Operator Overloading
- ✓ Data Conversions
- ✓ Inheritance, Polymorphism
- ✓ Exception Handling, Templates
- ✓ Input and Output Streams

**4. Module 4-RC & Network: - Introduction of network elements and its properties.**

- Introduction of Electronic Device circuit.
- Semiconductor material and its properties, Basic information of Doping, Diffusion, Conductivity, Mobility of material and more on.
- Working of Diode and its numerical on the basis of application.
- Introduction of Bipolar Junction Transistor and its region of operation in terms of numerical.
- Circuit designing on tools and analysis like DC analysis, Power analysis, Transient analysis, Temperature effect, Corner frequency and more on.
- MOS fabrication steps and difference between MOSFET and BJT.
- MOSFET properties and its numerical.
- Circuit designing on tools and analysis like DC analysis, Power analysis, Transient analysis, Temperature effect, Corner frequency and more on.
- Circuit & Layout Design of Inverter and Digital gates.

**5. Module 5. Introduction to Software and Schematic Design- PCB Design**

- Software (KIKAD): - Practical view
  - ✓ Library.
  - ✓ Project Making.
  - ✓ Adding Components.
  - ✓ Tools
- PCB Schematics Design: -
  - Introduction to Schematic Design.
  - Creating schematic File.
  - Placing, editing, and connecting parts and Electrical symbols.
  - About library and Part.

- Connection between electrical Symbols.
- Name and value.
- Adding and editing
- Graphical text.
- ERC checking
- Circuits on Schematics:
  - ✓ Power Supply
  - ✓ Fire Alarm
  - ✓ RF Circuit
  - ✓ Motor Drivers Circuit
- Types of Resister.
  - ✓ Fixed.
  - ✓ Adjustable/variable.
  - ✓ Carbon composition type
  - ✓ Wire wound.
  - ✓ Metalized
- Types of Capacitor.
  - ✓ Electrolytic.
  - ✓ Ceramic.
  - ✓ Axial lead type.
  - ✓ Radial lead type.
  - ✓ Variable.
- Types of Inductor
  - ✓ Coupled.
  - ✓ Multi-layer, Power, Rf.
  - ✓ Surface mounted.
- Types of diode.
  - ✓ Small/large signal.
  - ✓ Zener, Constant current.
  - ✓ Schottky, Tunnel, Varactor
  - ✓ Transistor.
  - ✓ FET, BJT, L293D
  - ✓ MAX232, Atmel IC.
- Simplifying PCB Design
  - ✓ ERC (Errors Rule Check)
- Circuit simulation on Bread board.
  - ✓ Circuit simulation on Tina-TI.

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