



# AVERIXIS SOLUTIONS

# EMBEDDED SYSTEM

MENTORSHIP PROGRAM

60 DAYS

# **WHO WE ARE?**

## **The Starting Point For Your Career Path**

We help undergrad and post grad students struggling to get industrial experience with our Training + Internship programs which help them to become corporate-ready individuals and possess the skillset to take on any challenges without any self-doubt.

**Take the Right Turn, With Us!**



Starting Point For Your Career Path

# Our Mission & Vision

We help undergrad and post grad students struggling to get industrial experience with our Industry Grade Mentorship programs which help them to become corporate-ready individuals and possess the skillset to take on any challenges without any self-doubt.



## Mission

Our aim is to become one of the most preferred education technology platforms across the globe.



## Vision

We envision a world in which each student receives the effective, equitable, and engaging education they need to reach their full and unique potential.

# Lesson Plan

**Week 1**

Introduction to Embedded Systems

What are Embedded Systems?

Types of Embedded Systems

Basic Architecture of Embedded Systems

Outcome-driven Project 1: LED Blinking

Setting up the development environment

Writing code to blink an LED on a microcontroller

Uploading the code to the microcontroller

Programming Languages for  
Embedded Systems  
C and C++, Assembly Language  
Comparison of Programming Languages

Outcome-driven Project 2:  
Button Control of LED

Using a push-button to control the LED state  
Implementing a debounce algorithm

Memory and I/O Devices  
Types of Memory (ROM, RAM, Flash)  
Types of I/O Devices (GPIO, Timers, ADC, DAC)

## **Week 2**

**Outcome-driven Project 3:**  
**Serial Communication with PC**

**Configuring a serial communication protocol**  
**Sending data from microcontroller to PC**

**Interrupts and Timers**

**Interrupt handling mechanism**  
**Types of Interrupts**  
**Timers and their use in Embedded Systems**

## Outcome-driven Project 4: Temperature Sensor Readings

Interfacing a temperature sensor with the microcontroller  
Reading the sensor data and displaying it on an LCD

Peripherals and their Interfacing  
Serial Peripheral Interface (SPI)  
Inter-Integrated Circuit (I2C)  
Universal Asynchronous Receiver-Transmitter (UART)

Outcome-driven Project 5:  
Interfacing with an IR Sensor  
Interfacing with an Infrared (IR) sensor  
Detecting the IR signal and controlling the LED based on the input

## **Week 3**

Real-Time Operating Systems (RTOS)

Introduction to RTOS

Tasks, Scheduling, and Priorities in RTOS

Example RTOS – FreeRTOS

Outcome-driven Project 6:

Traffic Light Controller

Controlling a traffic light system using RTOS

Implementing a state machine to control the lights

**Debugging and Troubleshooting Techniques**

**Debugging techniques for Embedded Systems**

**Hardware and Software Debugging Tools**

**Troubleshooting Techniques**

**Outcome-driven Project 7:**

**PWM Generation**

**Configuring a Pulse Width Modulation (PWM) signal**

**Controlling the brightness of an LED using PWM**

**Communication Protocols**

**Controller Area Network (CAN)**

**Bluetooth Low Energy (BLE), Wi-Fi**

## **Week 4**

Outcome-driven Project 8:

Interfacing with a Keypad

Interfacing with a keypad

Reading keypad inputs and displaying the input on an LCD

Embedded System Design Considerations

Power Management

Security, Safety

**Outcome-driven Project 9: Sound Generation**

**Generating sound using the microcontroller**

**Controlling the frequency and duration of the sound output**

**System-on-Chip (SoC)**

**What is an SoC?**

**Examples of SoC**

**Advantages and Disadvantages of SoC**

**Introduction to Real-Time Operating Systems (RTOS)**

**Understanding the need for RTOS in embedded systems**

**Basic concepts of RTOS**

**Popular RTOS platforms**

## **Week 5**

**Hands-on with RTOS**

Setting up an RTOS platform

Creating a simple RTOS application

Debugging an RTOS application

**Embedded System Interfacing Techniques**

Overview of embedded system interfacing

Different types of interfaces (SPI, I2C, UART, etc.)

Hands-on: Interfacing an external device using SPI

**Hands-on with Interfacing**  
**Interfacing an external device using I2C**  
**Debugging techniques for interfacing**

**Introduction to Wireless Communication in Embedded Systems**

**Types of wireless communication protocols**  
**(Bluetooth, Wi-Fi, Zigbee, etc.)**

**Use cases of wireless communication in embedded systems**

**Hands-on: Implementing Bluetooth communication**  
**between two devices**

**Embedded System Security**

**Understanding the importance of security in embedded systems**

**Common security threats and attacks**

**Techniques for securing embedded systems**

**Hands-on with Security**

**Implementing secure communication between  
two devices using encryption**

**Detecting and mitigating security threats in an embedded system**

**Recap and Final Project Discussion**

**Recap of all the topics covered in the training program**

**Discussion on the final project to be completed by students**

**Q&A session**

# Our Collaborated Companies



# Our Alumni Work At



# SUPPLEMENTARY PERKS



Resume Building Session



Our Courses Give You Hands On Experience With  
Mock Interviews

# Dont Hesitate To Contact us!

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