Internship (ECE/EEE/EIE/CSE/IT) – (60 Hours)

10 days – 6 hours/day | 20 days – 3 hours/day| 30 days – 2 hours/day

Course structure (Any one of (8051/Arduino/PIC/ARM) with MATLAB)

1. Overview

1.1. Embedded System introduction & Software installation

- ➢ Introduction to Embedded System
- ➢ Introduction to Microcontroller / Microprocessor
- ➢ Embedded system Vs Non-Embedded system
- ➢ Current trends in technology
- ➢ Future scope
- ➢ Introduction to Programming Language
- ➢ Introduction to software tool chain (Depends on MCU target)
- ➢ Depends on MCU target Basics of development board, IDE, Debugger, Flash programming

1.2. MATLAB introduction & Software installation

- ➢ Why MATLAB?
- ➢ History
- ➢ Its strengths
- ➢ Weaknesses
- ➢ Competitors
- ➢ Starting MATLAB, Using MATLAB as a calculator, Quitting MATLAB
- ➢ Familiar with MATLAB windows

2. Learning of I/O with Real time implementation

- ❖ *Experiment 1: GPIO access*
  - ❖ Single port register access - Single LED toggle
  - ❖ Full port register access   - Bar graph LED toggle
- ❖ *Experiment 2: 7-Segment LED display interface*
  - ❖ Single port register access method - 7-Segment display

- ❖ *Experiment 3: Button interface*
  - ❖ Digital input sensing – Push button interface
  - ❖ Pull-Up logic
  - ❖ Pull-Down logic
- ❖ *Experiment 4: Matrix keyboard interface*
  - ❖ Matrix button interface
- ❖ *Experiment 5: 16*2 LCD interface*
  - ❖ 4bit data mode
- ❖ *Experiment 6: Sensor interface*
  - ❖ Current sensor interface
  - ❖ Sensor calibration & Sensor sensitivity calculation
- ❖ *Experiment 7: HW/SW Serial port initialize*
  - ❖ 9600 baud rate, 8-Bit data, No parity, 1-stop bit configuration
- ❖ *Experiment 8: Serial communication method*
  - ❖ Synchronous & Asynchronous Serial Programming
  - ❖ UART Tx & Rx interrupt
  - ❖ Serial port request and acknowledgement method
- ❖ **Experiment 9: Communication protocol**
  - ❖ Bluetooth & Zigbee
- ❖ **Experiment 10: MATLAB interface (Image processing)**
  - ❖ Script file
  - ❖ Input commands
  - ❖ Output commands
  - ❖ Structure of function file
  - ❖ Inline functions
  - ❖ Feval command
  - ❖ Comparison between script file and function file
  - ❖ Basic C Programming commands
    - ❖ Relational and Logical Operators
    - ❖ If-else statements
    - ❖ Switch-case statements
    - ❖ For loop
    - ❖ While loop
    - ❖ Special commands(Break and continue)

- ❖ Import data from large database
- ❖ Export data to own file or database
- ❖ Manipulate the Image
- ❖ Display images with separated planes
- ❖ Images with ALU
- ❖ Image Edges
- ❖ Image with Noise
- ❖ Images with RGB & YCBCR
- ❖ Image with Filter
- ❖ GUI Implementation
    - ❖ Creating menu window for providing input
    - ❖ Creating graphical user interface table
    - ❖ Modifying table content
    - ❖ Creating a database
- ❖ MATLAB app generation
- ❖ **Experiment 11: MATLAB interface (Live GUI development)**
    - ❖ Real-time serial plotting
    - ❖ Alert pop-up on MATLAB display
    - ❖ Data log on Excel sheet/ CSV format
    - ❖ Database access
- ❖ **Experiment 12: Technology specified**
    - ❖ Biometric based remote user authentication
    - ❖ Watermarking application
    - ❖ TTS (Text to Sound)
    - ❖ ITT (Images to text)
    - ❖ Artificial Neural Network Simulation
    - ❖ Real-Time Face Detection
    - ❖ Colour-Sensing Robot
    - ❖ Hearing Aids System
    - ❖ Tremor Quantification and Parameter Extraction
- ❖ **Task competition**
    - ✓ On spot logical task in embedded program
    - ✓ Time level completing task
    - ✓ Performance evaluation

MESSAGE FROM FOUNDER & CEO

Dear Client,

Greetings from our aspect,

We are providing the best solutions for the evergreen technologies like
- ➢ *EMBEDDED SYSTEM's*
- ➢ *ROBOTICS*
- ➢ *INTERNET OF THINGS (I.O.T)*
- ➢ *MATLAB*
- ➢ *FPGA*
- ➢ *RASPBERRY PI*
- ➢ *DATA MINING*
- ➢ *BIG DATA*
- ➢ *JAVA*
- ➢ *ANDROID*
- ➢ *DOTNET*

Note:

"Active Galaxy professionally assists Research scholars and others who want to do their thesis / Journal / Books / Products. The institute's senior faculty members will discuss whatever ideas the Research scholars have an assist to quickly transform them into research-based concepts to proceed further into practical working."

All the very best for your future endeavors.

**AG Plus:
1. **Learn & Interact with renowned Industry Experts.**
2. **Hands on experience.**
3. **Doorstep Project delivery & Services.**

Thanks & Warm Regards...
GOPALAKRISHNAN SUBRAMANIAM,
FOUNDER & CEO,
ACTIVE GALAXY.