

**AG Groups:**

- Active Galaxy (An Engineering Idea), Chennai
- M.Phil Project center (A Research Institute for M.Phil / PHD), Chennai
- IJADST (International Journal)
- AG Welfare Association, Chennai

## **Internship (ECE/EEE/EIE/CSE/IT) – (20 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))**

#### **1. Overview**

**Embedded System (Depends on MCU target) 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

#### **2. Learning of I/O with Real time implementation**

- ❖ **Experiment 1: Single GPIO access**
  - ❖ Single port register access - Single LED toggle
- ❖ **Experiment 2: Multiple GPIO access**
  - ❖ Full port register access - Bar graph LED toggle
- ❖ **Experiment 3: 7-Segment LED display interface**
  - ❖ Single port register access method - 7-Segment display
- ❖ **Experiment 4: 7-Segment LED display interface**
  - ❖ Full port register access method (Hexadecimal method)
- ❖ **Experiment 5: Button interface**
  - ❖ Digital input sensing – Push button interface
  - ❖ Pull-Up logic & Pull-Down logic
- ❖ **Experiment 6: 16\*2 LCD interface**
  - ❖ 4bit data mode & Scrolling display

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- ❖ **Experiment 7: 16\*2 LCD interface task**
  - ❖ Increment counter & Decrement counter
- ❖ **Experiment 8: ADC on LCD**
  - ❖ Variable resistor (analog input reading)
  - ❖ 8Bit ADC calculation and resolution talk
- ❖ **Experiment 9: Sensor interface**
  - ❖ Current sensor interface
  - ❖ Sensor calibration & Sensor sensitivity calculation
- ❖ **Experiment 10: HW/SW Serial port initialize**
  - ❖ 9600 baud rate, 8-Bit data, No parity, 1-stop bit configuration
- ❖ **Experiment 11: Serial communication method**
  - ❖ Synchronous & Asynchronous Serial Programming
  - ❖ UART Tx & Rx interrupt
- ❖ **Experiment 12: ADC on serial port**
  - ❖ Sensor data on serial port
- ❖ **Experiment 13: Hand shaking serial port**
  - ❖ Serial port request and acknowledgement method
- ❖ **Experiment 14 : DC motor control**
  - ❖ DC motor ON/OFF
- ❖ **Experiment 15 : DC motor direction control**
  - ❖ DC motor forward
  - ❖ DC motor Reverse
- ❖ **Experiment 16 : DC motor speed control**
  - ❖ PWM pulse generation & Duct cycle calculation
  - ❖ DC motor speed control
- ❖ **Experiment 17: Buzzer control**
  - ❖ Digital Buzzer ON/OFF
- ❖ **Experiment 18: Push button interface**
  - ❖ Single button interface
- ❖ **Experiment 19: Matrix keyboard interface**
  - ❖ Matrix button interface
- ❖ **Experiment 20: Password matching**
  - ❖ OTP generation
  - ❖ OTP verifying and access control

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- ❖ **Experiment 21: Switch interrupt**
  - ❖ Switch read Polling method
  - ❖ Switch read interrupt method
- ❖ **Experiment 22: Tag protocol**
  - ❖ RFID & NFC interface
- ❖ **Experiment 23: Communication protocol**
  - ❖ Bluetooth & Zigbee
  - ❖ Wi-Fi & Ethernet
- ❖ **Experiment 24: Application specified**
  - ❖ GSM & GPS
  - ❖ IOT
- ❖ **Experiment 25: Real-time implementation**
  - ❖ I2C protocol – EEPROM interface
  - ❖ I2C protocol – RTC interface
  - ❖ SPI protocol – SD card interface
  - ❖ CAN protocol
  - ❖ USB protocol – Keyboard/Mouse
- ❖ **Experiment 26: Technology specified**
  - ❖ Voice reorganization
  - ❖ Fingerprint reorganization
  - ❖ Magnetic card reader
- ❖ **Experiment 27: Industrial Specified**
  - ❖ DMD P10 MATRIX display
  - ❖ DTH sensor
  - ❖ HX710a/HX711 24Bit ADC
- ❖ **Experiment 28: MATLAB interface (Image processing)**
  - ❖ Introduction about MATLAB
  - ❖ Basic image processing commands
  - ❖ Image processing tool handling
  - ❖ MATLAB app generation
- ❖ **Experiment 29: MATLAB interface (Live GUI development)**
  - ❖ Real-time serial plotting
  - ❖ Alert pop-up on MATLAB display

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- ❖ Data log on Excel sheet/ CSV format
- ❖ Database access

❖ **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...  
**GOPALKRISHNAN SUBRAMANIAM,**  
FOUNDER & CEO,  
ACTIVE GALAXY.