Skill Development

Building Expertise

S2V Automation building expertise in

- Industrial Automation industry

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- Embedded System

By providing best training facility, which includes infrastructure such as SW tools, HW modules, Control System, Boards and Faculty.

Faculty members is having 10-12 years of industry experience

Industrial Automation – Training Modules

Overview

- Fundamentals of Industrial Automation
- Architecture of DCS/PLC/SCADA
- Industrial Communication Protocols
- Substation Automation
- Overview of Industry 4.0
- Logical Thinking

Industrial Automation Specialization

- Industrial Field Instruments and Controllers
- Programming and Logic development – PLC/SCADA
- Communication Interfaces – Profibus/ProfiNet/Modbus
- Control System Design and Trouble shooting
- Plant and Factory Automation
- Control and Process Variables

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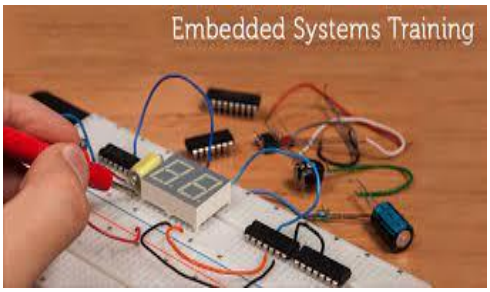


- Electrical Wiring, Relays & Electrical Circuits.

Industrial Automation Health, Safety & Environment (HSE)

- Electrical Safety
- Integrity, Anti-Bribery
- Personal Protective Equipment – PPE
- Working at Height

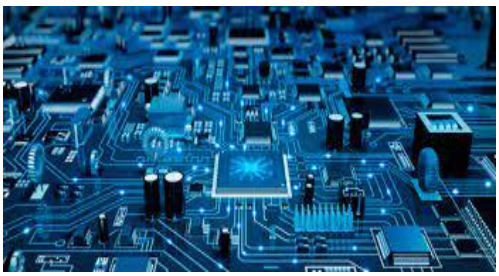
Embedded System – Training Modules

Overview

- Fundamentals of Electronics and Embedded Systems
- Programming in C, Embedded C
- Oops with C++
- Linux System Programming
- Logical Thinking

Embedded Specialization

- ARM 7 & Cortex M3 programming using Embedded C
- Programming using ARM Cortex M3 based MCU STM32F446
- Embedded Protocols - UART, SPI, I2C, ADC, CAN & USB
- RTOS –Hands-on using Free RTOS of Amazon
- Linux Device Drivers and Porting on Beagle Bone Black
- Scripting – Python and Test Automation



Automotive Specialization

- Communication Protocols - UART, SPI, I2C
- AUTOSAR Design Flow using CAN, CAN Analyzer, LIN
- MCAL Architecture

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IoT Specialization

- Functional Safety and Cyber Security
- Sensor Integration
- Bluetooth, WiFi and RF Communication
- GSM and GPRS Module development
- Client Server Communication

S2V Automation building expertise in:

- Industrial Automation industry

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- Embedded System

Features:

- Best in class training facility
- HW & SW Tools
- Hands on Circuits design, Simulation and board bring up & Testing
- Controllers, I/O Modules,
- Hands on Embedded Programming
- Schematic and PCB design
- EMC standards and certifications: IEC/ISO

Applicable Segments:

- Automation Industries

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EMBEDDED SOFTWARE SYSTEM TRAINING MODULE

S2V AUTOMATION

Embedded technology is the topmost technology which is required for multiple domains, such as Automotive, Locomotive, Aviation, Industrial Automation, supply chain, Networking, and So on.
The Internet of Things (IoT) which is nothing but connecting things to the internet is catch up most of all the domains which are mentioned above.
In the market, embedded skills play a significant role to implement real-time and critical solutions in numerous domains, this training is designed to gain the embedded skills which are required for the market.

1. INTRODUCTION TO EMBEDDED SYSTEMS:

Here are the training modules for an introduction to embedded systems:

1.1. Overview of Embedded Systems
1.2. Basics of Microcontrollers
1.3. Embedded Systems Programming
1.4. Peripherals and Interfaces
1.5. Design and Development of Embedded Systems
1.6. Introduction to Internet of Things
1.7. Case Studies and Projects

Overall, the training should provide a solid foundation in embedded systems and equip learners with the skills and knowledge needed to develop and program embedded systems for a variety of applications.

2. MICROCONTROLLERS AND MICROPROCESSORS:

Microcontrollers and microprocessors are ubiquitous in modern electronics and have a wide range of applications. A module on microcontrollers and microprocessors would typically cover the following topics:

2.1. Introduction to microcontrollers and microprocessors
2.2. Architecture and organization of microcontrollers and microprocessors
2.3. Memory and I/O interfacing
2.4. Instruction set and programming
2.5. Interrupts and timers
2.6. Analog-to-digital and digital-to-analog conversion
2.7. Serial communication protocols such as UART, SPI, and I2C
2.8. Application-specific integrated circuits (ASICs)
2.9. Real-time operating systems (RTOS)
2.10. Power management and battery-powered systems
2.11. Sensor integration and data acquisition

An introductory course would cover the basics of microcontrollers and microprocessors, including architecture, programming, and interfacing.

3. MICROCONTROLLER ARCHITECTURE:

A microcontroller is a small computer on a single integrated circuit that is designed to control specific devices, such as robots, sensors, or medical devices.

Here is a brief outline of the main modules or components found in a typical microcontroller architecture:

3.1. Central Processing Unit (CPU)
3.2. Memory
3.3. Input/output (I/O) Ports
3.4. Timers/Counters
3.5. Analog-to-Digital Converter (ADC)
3.6. Communication Interfaces
3.7. Interrupts

Overall, the combination of these modules and components provides a powerful and flexible platform for building a wide range of microcontroller-based applications.

4. EMBEDDED SOFTWARE DESIGN:

The scope of Embedded Software Design module typically involves the development of software that is integrated into a hardware system or device, such as microcontrollers, microprocessors, and other programmable devices.

Some of the key topics that are typically covered in an Embedded Software Design module may include:

4.1. Introduction to embedded systems and their design
4.2. Programming languages for embedded systems
4.3. Embedded hardware architecture and interfacing with peripherals
4.4. Embedded full stack development
4.5. Real-time operating systems and scheduling algorithms
4.6. Memory management and optimization techniques
4.7. Designing and debugging embedded software systems
4.8. Embedded system security and safety considerations
4.8. Testing and validation techniques for embedded systems

By the end of this module, students should have a good understanding of the key concepts and techniques used in the design and development of embedded software systems.

5. EMBEDDED PROGRAMMING LANGUAGES:

Embedded Programming Languages are specialized programming languages designed to program embedded systems such as microcontrollers, DSPs, and FPGAs. The scope of the Embedded Programming Languages module includes the following:

5.1. Introduction to Embedded Systems
5.2. Embedded C and C++ Programming
5.3. Assembly Language Programming
5.4. Real-time Operating Systems (RTOS)
5.5. Hardware Description Languages (HDLs)

Overall, the scope of Embedded Programming Languages module is vast and covers a range of topics that are crucial for developing efficient and reliable embedded systems.

6. EMBEDDED HARDWARE DESIGN:

The scope of embedded hardware design module includes the following:

6.1. Understanding of Microcontrollers
6.2. Circuit Design
6.3. PCB Design
6.4. Interfacing Peripherals
6.5. Real-Time Operating Systems
6.6. Testing and Debugging
6.7. Security and Safety

Overall, the scope of embedded hardware design module is quite extensive, covering different aspects of embedded system design, ranging from microcontrollers to PCB design, testing, debugging, security, and safety.

7. DEBUGGING AND TESTING:

Embedded systems are computer systems that are integrated into other devices or products to control specific functions or tasks. These systems often have limited resources such as memory, processing power, and storage, which can make debugging and testing a challenging task. Embedded debugging and testing modules are tools and techniques used to identify and fix defects in an embedded system's software and hardware.

The scope of embedded debugging and testing modules includes:

7.1. Debugging software
7.2. Hardware testing
7.3. Integration testing
7.4. Performance testing
7.5. Security testing

In summary, embedded debugging and testing modules are essential tools in the development of reliable and efficient embedded systems.

8. EMBEDDED SYSTEM INTEGRATION:

Embedded System Integration module refers to the process of integrating hardware and software components to create a functioning embedded system.

The scope of Embedded System Integration module includes:

8.1. Hardware integration
8.2. Software integration
8.3. Communication integration
8.4. Testing and validation
8.5. Documentation and maintenance

In summary, the Embedded System Integration module is a critical part of developing an embedded system. It involves integrating different hardware and software components to create a functioning system that meets the requirements and specifications. Proper integration, testing, and documentation ensure that the system is reliable, efficient, and can be maintained over its lifetime.

9. INDUSTRY STANDARDS AND BEST PRACTICES:

Industry Standards and Best Practices module refers to the set of guidelines and practices that are widely accepted as the most effective and efficient approaches to various aspects of a particular industry. This module aims to ensure that organizations meet the quality, safety, and performance requirements of their respective industries.

The scope of Industry Standards and Best Practices module includes:

9.1. Quality standards
9.2. Safety standards
9.3. Performance standards:
9.4. Best practices
9.5. Compliance standards

In summary, Industry Standards and Best Practices module focuses on the adoption of guidelines and practices that ensure an organization meets the quality, safety, and performance requirements of development.

10. PROJECT-BASED LEARNING:

Industry Standards and Best Practices module refers to the set of guidelines, principles, and practices that are widely recognized and accepted as the most effective and efficient approaches to various aspects of a particular industry. This module aims to ensure that organizations meet the quality, safety, and performance requirements of their respective industries.

Some of the key topics that are typically covered in an Embedded Software Design module may include:

10.1. Quality standards
10.2. Safety standards
10.3. Performance standards
10.4. Best practices
10.5. Compliance standards

In summary, Industry Standards and Best Practices module focuses on the adoption of guidelines and practices that ensure an organization meets the quality, safety, and performance requirements of development.

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