



AALIM MUHAMMED SALEGH COLLEGE OF ENGINEERING
IAF-AVADI, CHENNAI - 55
DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING



CIRCULAR

AMSCE/EEE/CIR/VAC/003/2021-22

Date: 04.04.2022

The Department of Electrical and Electronics Engineering plans to conduct a Value Added Course on **Embedded Systems design** by **Mr.Kishore, Design Engineer, M/s BHC Electric Company**, for the benefit of III Year students. This course is scheduled from 05.04.2022 to 22.04.2022 **(4:00 PM to 6:00 PM)** for 4 weeks (30 Hrs).

All the students must attend all the classes with a minimum of 75% attendance and score 50% on the quiz. Students who complete the course successfully will receive certificates.

Rajeev
04/04/22
HOD/EEE

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Approved by AICTE & NAAC Accredited Institution



DEPARTMENT OF
ELECTRICAL AND ELECTRONICS ENGINEERING
Organizing

VALUE ADDED COURSE ON EMBEDDED SYSTEM DESIGN

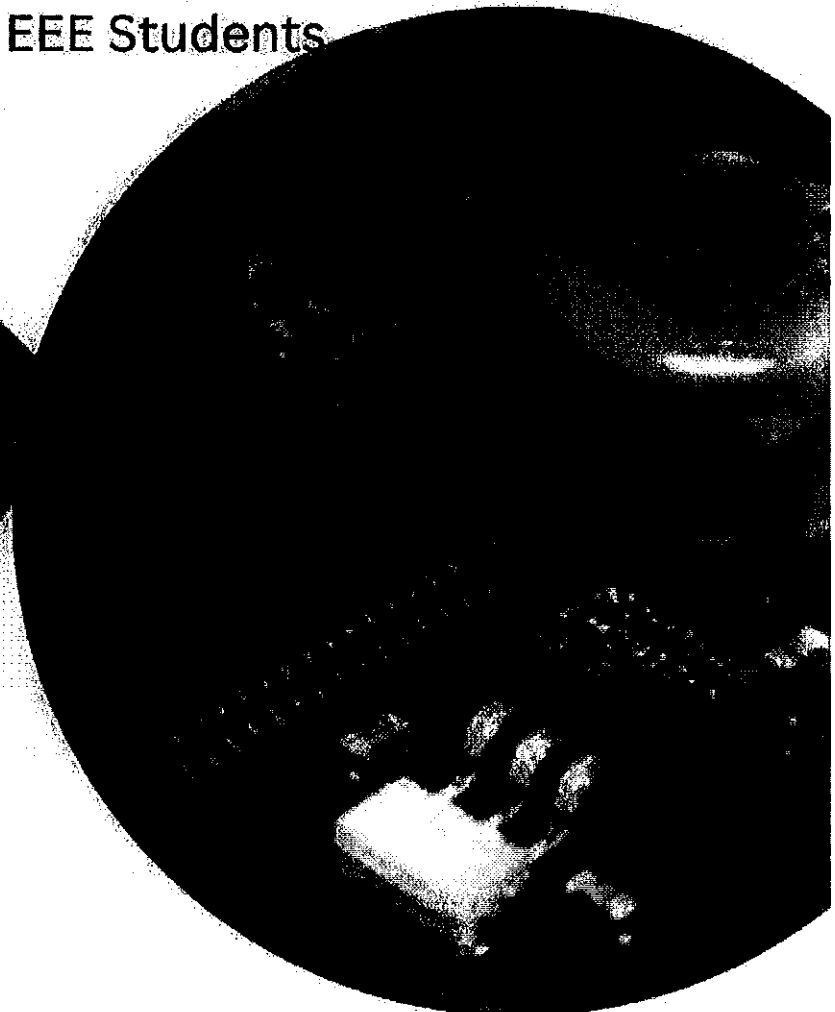
For III Year EEE Students

RESOURCE PERSON

Mr. Kishore

Design Engineer,

BHC Electric Company




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Er.M.S.RAJAN,
Assistant Professor
Head/EEE

Dr.S.SATHISH
Principal



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DEPARTMENT OF ELECTRICAL AND ELECTRONICS

ENGINEERING



REPORT FOR THE VALUE ADDED COURSE ON EMBEDDED SYSTEM DESIGN

Course Name: EMBEDDED SYSTEM DESIGN

Date: 05.04.2022 to 22.04.2022

Time: 04.00 P.M to 06.00 P.M

Course Hours: 30 Hours

Attended Student: 32 Students

Student Certified: 32 Students

No. of Modules: 4 Modules

Course Overview:

The "Embedded Systems Design" course covers the design and development of embedded systems, focusing on the hardware and software aspects of building efficient, reliable, and safe systems. Students learn to design, simulate, and implement embedded systems using various tools and technologies.

Course Objectives:

- Understand the fundamentals of embedded systems and their design principles
- Design and develop embedded systems using hardware and software tools
- Learn about microcontrollers, processors, and other embedded hardware components
- Understand embedded software development, including programming languages and operating systems
- Develop problem-solving skills using embedded systems

Course Outline:

1. Introduction to Embedded Systems
2. Embedded Hardware Components (microcontrollers, processors, memory, I/O)
3. Embedded Software Development (programming languages, operating systems)
4. System Design and Architecture
5. Interfacing and Communication (serial, parallel, networking)
6. Real-Time Systems and Interrupt Handling
7. Power Management and Low-Power Design
8. Safety and Security Considerations
9. Design Tools and Methodologies (simulation, modeling, verification)


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10. Project Development and Implementation

Key Concepts:

- Embedded hardware components (e.g., ARM, AVR, PIC)
- Embedded software development (e.g., C, C++, Python)
- System design principles (e.g., performance, power, size)
- Interfacing techniques (e.g., SPI, I2C, UART)
- Real-time systems and interrupt handling
- Power management and low-power design techniques
- Safety and security considerations (e.g., fault tolerance, encryption)

Hands-on Activities:

- Designing and simulating an embedded system using a hardware description language (HDL)
- Developing a microcontroller-based project using a programming language (e.g., C, Python)
- Implementing a sensor-based system using interfacing techniques
- Designing a real-time system with interrupt handling
- Developing a low-power embedded system using power management techniques

Resources:

- Textbook: "Embedded System Design" by Frank Vahid
- Online resources: tutorials, videos, articles on embedded system design
- Development tools: hardware and software tools such as microcontroller development boards, compilers, simulators, and debuggers

Assessment:

- Project development and implementation (40%)
- Quizzes and assignments (30%)
- Midterm and final exams (30%)


25/4/22

COURSE-COORDINATOR


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From

Mr. S. Rajesh Kanna,
Assistant Professor,
Department of Electrical and Electronics Engineering,
Aalim Muhammed Salegh College of Engineering,
Muthapudupet, Avadi IAF,
Chennai – 600055.

To

The Principal,
Aalim Muhammed Salegh College of Engineering,
Muthapudupet, Avadi IAF,
Chennai – 600055.

Dear Sir,

Sub: Request for Approval of Value-Added Course: Embedded System Design – reg.

I am writing to request your approval for the value-added course titled "Embedded System Design" for III year EEE students from 05.04.2022 – 22.04.2022. I believe that the course will enhance the skills and competencies of our students. This course aims to provide practical knowledge and skills that complement our existing curriculum and prepare our students for the demands of the workforce. Kindly consider the request and do the needful.

Yours Truly,

[Signature]
21/3/22

Submitted to Principal Sir.

Sir, I request you to kindly approve the said programme and do the needful.

Permitted to organize the
programme during 05.04.2022 – 22.04.2022

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21/3/22

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21/3/2022



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SYLLABUS FOR THE VALUE ADDED COURSE EMBEDDED SYSTEM DESIGN

MODULE I

Introduction to Embedded Systems

- Overview of Embedded Systems
- Applications and Examples
- Characteristics and Constraints
- Difference Between General-Purpose and Embedded Systems

Embedded System Architecture

- Components of Embedded Systems: Microcontrollers, Memory, I/O Devices
- Overview of Popular Microcontrollers (e.g., ARM, PIC, AVR)
- System Architecture: Hardware and Software Integration

Microcontroller Programming

- Introduction to Embedded C
- Basic Programming Concepts for Embedded Systems
- GPIO, Interrupts, and Timers
- Hands-on: Basic Microcontroller Programming

MODULE II

Real-Time Operating Systems (RTOS)

- Introduction to RTOS Concepts
- Task Scheduling and Management
- Inter-Task Communication
- Hands-on: Simple RTOS Implementation

Sensor and Actuator Interfacing

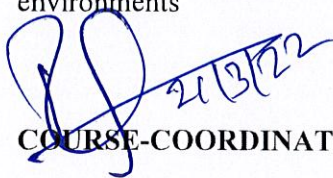
- Types of Sensors and Actuators
- Interfacing Techniques (Analog and Digital)
- Hands-on: Sensor and Actuator Projects

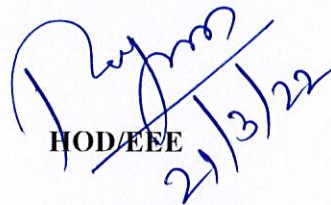



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Recommended Resources:

- Textbook: "Embedded Systems: Introduction to ARM Cortex-M Microcontrollers" by Jonathan W. Valvano
- Online resources and documentation for specific microcontrollers and development environments


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SCHEDULE FOR THE VALUE ADDED COURSE EMBEDDED SYSTEM DESIGN

Time: 04.00 P.M to 06.00 P.M

WEEK 1 : 05.04.2022 to 09.04.2022

Introduction to Embedded Systems

- Overview of Embedded Systems
- Applications and Examples
- Characteristics and Constraints
- Difference Between General-Purpose and Embedded Systems

Embedded System Architecture

- Components of Embedded Systems: Microcontrollers, Memory, I/O Devices
- Overview of Popular Microcontrollers (e.g., ARM, PIC, AVR)
- System Architecture: Hardware and Software Integration

Microcontroller Programming

- Introduction to Embedded C
- Basic Programming Concepts for Embedded Systems
- GPIO, Interrupts, and Timers
- Hands-on: Basic Microcontroller Programming

WEEK 2 : 11.04.2022 to 16.04.2022

Real-Time Operating Systems (RTOS)

- Introduction to RTOS Concepts
- Task Scheduling and Management
- Inter-Task Communication
- Hands-on: Simple RTOS Implementation




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Sensor and Actuator Interfacing

- Types of Sensors and Actuators
- Interfacing Techniques (Analog and Digital)
- Hands-on: Sensor and Actuator Projects

Communication Protocols

- Serial Communication (UART, SPI, I2C)
- Wireless Communication (Bluetooth, Zigbee, Wi-Fi)
- Network Protocols in Embedded Systems
- Hands-on: Implementing Communication Protocols

Power Management in Embedded Systems

- Power Consumption in Embedded Systems
- Power Management Techniques
- Low Power Design Strategies
- Hands-on: Designing for Energy Efficiency

WEEK 3 : 18.04.2022 to 22.04.2022

Embedded System Design Process

- System Specifications and Requirements
- Design Methodologies (Top-Down and Bottom-Up)
- Prototyping and Testing Strategies
- Hands-on: Project Planning and Design

Debugging and Testing

- Debugging Techniques for Embedded Systems
- Tools for Embedded System Development (IDE, Debuggers)
- Testing Strategies and Quality Assurance
- Hands-on: Debugging Techniques

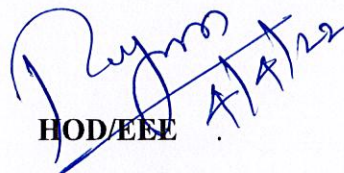
Project Presentations and Course Review

- Student Project Presentations
- Course Review and Discussion
- Future Trends in Embedded Systems
- Wrap-Up and Q&A Session

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 Certifate course on Embedded System Design
 Academic year- 2021 - 2022

S.No	Reg. no	NAME	5/4/22	6/4/22	7/4/22	8/4/22	9/4/22
1	110119105001	ABDUR RAHEEM M F	A	A	A	A	A
2	110119105002	ANNALAKSHMI P	Anno	Anno	Anno	Anno	Anno
3	110119105003	JAINULABDEEN ALMUBEEN AHAMED S	Jainu	Jainu	Jainu	Jainu	Jainu
4	110119105004	MOHAMED ASKAR ASIF S	Asif	Asif	Asif	Asif	Asif
5	110119105006	MOHAMED FIRNAS M	Firna	Firna	Firna	Firna	Firna
6	110119105007	MOHAMED HAMEED KAMSA K	Kamsa	Kamsa	Kamsa	Kamsa	Kamsa
7	110119105008	MOHAMED HUSSAIN K	Maha	Maha	Maha	Maha	Maha
8	110119105009	MOHAMED RISWAN N	Riswan	Riswan	Riswan	Riswan	Riswan
9	110119105010	MOHAMED SALMAN T	Salman	Salman	Salman	Salman	Salman
10	110119105011	PACCHA GUNA SEK HAR	Paccha	Paccha	Paccha	Paccha	Paccha
11	110119105012	SAIFUDEEN A	Saifu	Saifu	Saifu	Saifu	Saifu
12	110119105013	SAJID J	Sajid	Sajid	Sajid	Sajid	Sajid
13	110119105014	SALAHUDEEN S	Salahu	Salahu	Salahu	Salahu	Salahu
14	110119105015	TAHA NOORAIN	Taha	Taha	Taha	Taha	Taha
15	110119105301	MOHAMMED SHAKEEL B	Shakeel	Shakeel	Shakeel	Shakeel	Shakeel
16	110119105302	SYED MOHAMMED HAFEEZ M	Hafeez	Hafeez	Hafeez	Hafeez	Hafeez
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18	110120105002	AHAMED MYDEEN S	Mydeen	Mydeen	Mydeen	Mydeen	Mydeen
19	110120105005	KARTHIK S	Karthik	Karthik	Karthik	Karthik	Karthik
20	110120105006	KISHORE P.	KISHORE	KISHORE	KISHORE	KISHORE	KISHORE
21	110120105007	MOHAMED AKRAM N	Akram	Akram	Akram	Akram	Akram
22	110120105010	MOHAMED TOWFIQ A	Towfiq	Towfiq	Towfiq	Towfiq	Towfiq
23	110120105011	MOHAMMED RILWAN L	Rilwan	Rilwan	Rilwan	Rilwan	Rilwan

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25	110120105013	SYED MAKDUM S.J.	<i>Stab</i>	<i>Stab</i>	<i>Stab</i>	<i>Stab</i>	<i>Stab</i>
26	110120105303	ALFAREETH	<i>Alf</i>	<i>Alf</i>	<i>Alf</i>	<i>Alf</i>	<i>Alf</i>
27	110120105307	MOHAMED MUSSAMIL A	<i>Mus</i>	<i>Mus</i>	<i>Mus</i>	<i>Mus</i>	<i>Mus</i>
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29	110120105311	MOHAMMED AUTIFF	<i>Autiff</i>	<i>Autiff</i>	<i>Autiff</i>	<i>Autiff</i>	<i>Autiff</i>
30	110120105312	MOHAMMED MUJEEB .M	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>	<i>M</i>
31	110120105313	MOHAMMED RASHEED . M	<i>Ra</i>	<i>Ra</i>	<i>Ra</i>	<i>Ra</i>	<i>Ra</i>
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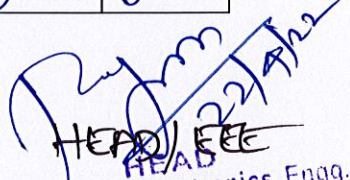
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31	110120105313	MOHAMMED RASHEED . M	R	R	R	R	R
32	110120105315	YOGESWARI	Ye	Ye	Ye	Ye	Ye


 HEAD OF THE DEPARTMENT
 Electrical & Electronics Engg.
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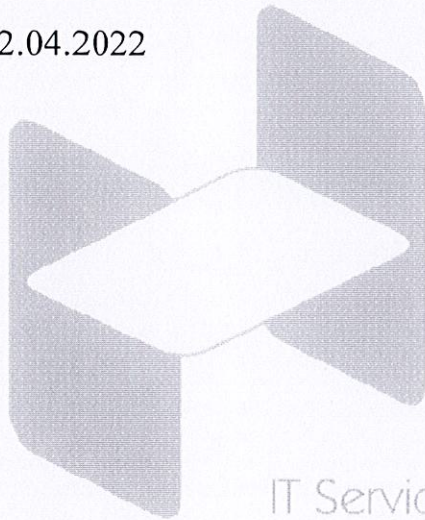
Mr.Kailas Menon
Manager,
HoistTechnologies



Date:22.04.2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **MOHAMED ASKAR ASIF S**, of Aalim Muhammed Salegh College of Engineering, Avadi-IAF has successfully completed “**EMBEDDED SYSTEM DESIGN**” Course conducted from 05.04.2022 to 22.04.2022



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TECHNOLOGIES
> Developments > Consultancy

IT Services

Sincerely,

Nirav

Nirav Narayanan,
HR - Team, Hoist Technologies

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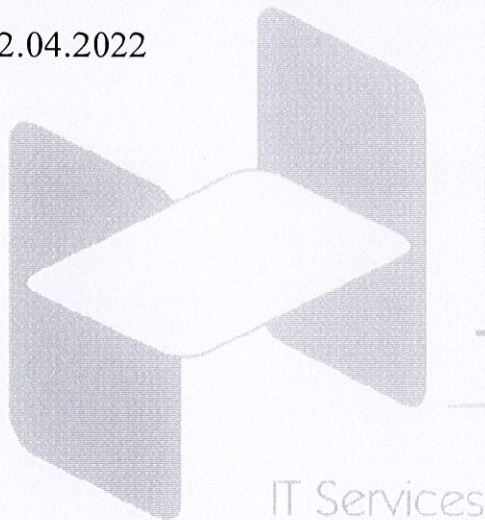
Mr.Kailas Menon
Manager,
HoistTechnologies



Date:22.04.2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **PACCHA GUNA SEKHAR**, of Aalim Muhammed Salegh College of Engineering, Avadi-IAF has successfully completed “**EMBEDDED SYSTEM DESIGN**” Course conducted from 05.04.2022 to 22.04.2022



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Sincerely,

Nirav

Nirav Narayanan,
HR - Team, Hoist Technologies

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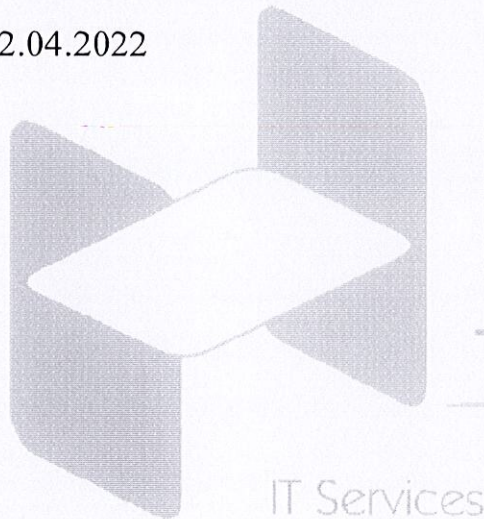
Mr.Kailas Menon
Manager,
HoistTechnologies



Date:22.04.2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **MOHAMMED SHAKEEL B**, of Aalim Muhammed Salegh College of Engineering, Avadi-IAF has successfully completed **“EMBEDDED SYSTEM DESIGN”** Course conducted from 05.04.2022 to 22.04.2022



HOIST
TECHNOLOGIES
▶ Developments ▶ Consultancy

Sincerely,

Nirav

[Signature]

Nirav Narayanan,

HR - Team, Hoist Technologies

PRINCIPAL
AALIM MUHAMMED SALEGH
COLLEGE OF ENGINEERING



Mr.Kailas Menon
Manager,
HoistTechnologies



Date:22.04.2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **MOHAMED HAMEED KAMSA K**, of Aalim Muhammed Salegh College of Engineering, Avadi-IAF has successfully completed “**EMBEDDED SYSTEM DESIGN**” Course conducted from 05.04.2022 to 22.04.2022



HOIST
TECHNOLOGIES

IT Services > Developments > Consultancy

Sincerely,

Nirav

Nirav Narayanan,

HR - Team, Hoist Technologies

PRINCIPAL
AALIM MUHAMMED SALEGH
COLLEGE OF ENGINEERING



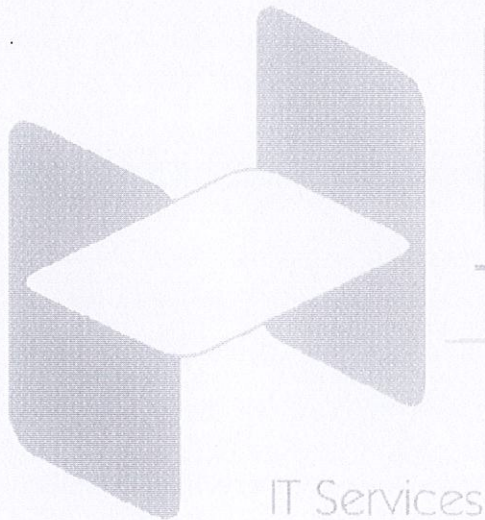
Mr.Kailas Menon
Manager,
HoistTechnologies



Date:22.04.2022

TO WHOMSOEVER IT MAY CONCERN

This is to certify that **SALAHUDEEN S**, of Aalim Muhammed Salegh College of Engineering, Avadi-IAF has successfully completed “**EMBEDDED SYSTEM DESIGN**” Course conducted from 05.04.2022 to 22.04.2022



Sincerely,

Nirav

Nirav Narayanan,
HR - Team, Hoist Technologies

[Handwritten Signature]

**PRINCIPAL
AALIM MUHAMMED SALEGH
COLLEGE OF ENGINEERING**

