ACADEMIC YEAR (2022-2023)						
			J K K Munirajah college of Technology, T.N.Palayam			Metric No 1.3.2
S.No	Name of the course	course code	programme offering	Contents mapping to		Number of students
				project work	internship	
(2022-2023) Regulation-2021						
1	Project Work I	AP4311	M.E. Applied Electronics	✓	✓	3
2	Project Work II	AP4411	M.E. Applied Electronics	✓	✓	3
3	Semiconductor Devices and Modeling	AP4153	M.E. Applied Electronics	✓		2
4	Industrial Internet of Things	AP4251	M.E. Applied Electronics	✓	✓	3
5	Embedded Systems	AP4203	M.E. Applied Electronics	✓	✓	3

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T.N.Palayam (Po), Gobi (Tk), Erode (Dt) – 638 506

M.E Applied Electronics

ACADEMIC YEAR 2022-2023

S.NO	REGISTER NUMBER	STUDENT NAME	PROJECT WORK	INTERNSHIP
1	731221401001	DIVYA R	✓	
2	731221401002	SEETHASUGANTHI S	✓	✓
3	731221401004	SUDEEP J	✓	

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M.E Applied Electronics

S.NO	Name of the Course that Include Experimental Learning through project Work/Internship/Field Visit
1	Project Work I
2	Project Work II
3	Semiconductor Devices and Modeling
4	Industrial Internet of Things
5	Embedded Systems

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PROJECT WORK

AP4203 **EMBEDDED SYSTEMS** L T P C
3 0 2 4

COURSE OBJECTIVES:

- Learn Embedded design challenges and design methodologies
- Study general and single purpose processor
- Understand bus structures
- Design a state machine and concurrent process models
- Know about Embedded software development tools and RTOS.

UNIT I EMBEDDED SYSTEM OVERVIEW 9

Embedded System Overview, Design Challenges – Optimizing Design Metrics, Design Methodology, RT-Level Combinational and Sequential Components, Optimizing Custom Single-Purpose Processors.

UNIT II GENERAL AND SINGLE PURPOSE PROCESSOR 9

Basic Architecture, Pipelining, Superscalar and VLIW architectures, Programmer's view, Development Environment, Application-Specific Instruction-Set Processors (ASIPs) Microcontrollers, Timers, Counters and watchdog Timer, UART, LCD Controllers and Analog-to-Digital Converters, Memory Concepts.

UNIT III BUS STRUCTURES 9

Basic Protocol Concepts, Microprocessor Interfacing – I/O Addressing, Port and Bus-Based I/O, Arbitration, Serial Protocols, I2C, CAN and USB, Parallel Protocols - PCI and ARM Bus, Wireless Protocols – IrDA, Bluetooth, IEEE 802.11.

UNIT IV STATE MACHINE AND CONCURRENT PROCESS MODELS 9

Basic State Machine Model, Finite-State Machine with Datapath Model, Capturing State Machine in Sequential Programming Language, Program-State Machine Model, Concurrent Process Model, Communication among Processes, Synchronization among processes, Dataflow Model, Real-time Systems, Automation: Synthesis, Verification : Hardware/Software Co-Simulation, Reuse: Intellectual Property Cores, Design Process Models

UNIT V EMBEDDED SOFTWARE DEVELOPMENT TOOLS AND RTOS 9

Compilation Process – Libraries – Porting kernels – C extensions for embedded systems – emulation and debugging techniques - RTOS - System design using RTOS.

TOTAL : 45 PERIODS

SUGGESTED ACTIVITIES:

1: Insist students to write a requirements form for a smart phone
2: Compare the use of different Microcontrollers for a particular ESD.
3: Application of a protocol for a specified application.
4: Write a Embedded C code for a given task.
5: design an embedded system for any type of real time application

PRACTICAL LIST:

Exercise - 1

Comparative study of software development tools and design steps with respect to FPGA based and Non - FPGA based (defined logic) embedded system development.
(For Example: consider any Spartan FPGA board for FPGA based Embedded System Consider any cortex- M based board for Non - FPGA based Embedded system)

Exercise - 2

Implement adder and decoder logic blocks in any one of the FPGA chip based development board.

Exercise - 3

Design and development of UART protocol logic block in any one of FPGA chip based development board.

Exercise - 4

Consider on board LEDS (any four) and timer logic block of cortex- M board. Write a program which enables LEDS to glow in different timing.

Exercise - 5

Consider on board switches and (2x16) LCD display develop a program which displays the status of switch activation.

Exercise - 6

Demonstrate GPIO based I/O interfacing by considering LM 35 temperature sensor and cortex- M board.

Exercise - 7

Development of one interfacing scheme which transmits data from one cortex- M board to another cortex- M board using on chip CAN logic blocks.

Exercise - 8

Consider on board EPROM IC of Cortex- M board by utilizing on chip I2c logic block transmit data to EPROM IC and receive stored data from EPROM IC.

Exercise - 9

Consider on board LEDs (4 Nos) of Cortex - M board. Demonstrate time management service concept of RTOS for glowing all four LEDS in different timings.

Exercise - 10

Consider two ultrasonic sensors which are interfaced with cortex- M board. Both are located some distance (2 meters) apart vertically so that the system can identify the movement of object in term of distance. consider data reception and display of each sensor as two different tasks by RTOS. Establish a RTOS based system to recognize the height of moving object.

Objective:

a. Able to understand embedded system design flow in FPGA chip based and Non - FPGA chip based embedded development boards.
b. Able to create simple logic blocks in FPGA chip based boards.
c. Able to understand interfacing scheme for Non - FPGA board scheme for Non - FPGA board
d. Able to utilize RTOS functions for interfacing practice

COURSE OUTCOMES:

At the end of the course the student will be:

CO1: Able to design an Embedded system
CO2: Understand a general and single purpose processor
CO3: Explain different protocols

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IOT BASED SMART GARBAGE MONITORING AND CONTROLLING SYSTEM

PHASE II REPORT

Submitted by

SUDEEP.J

(731221401004)

in partial fulfillment for the award of the degree

of

MASTER OF ENGINEERING

In

APPLIED ELECTRONICS

J.K.K MUNIRAJAH COLLEGE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

T.N PALAYAM

ANNA UIVERSITY, CHENNAI-600 025

OCTOBER 2023

PRINCIPAL
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OF TECHNOLOGY
T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

BONAFIDE CERTIFICATE

Certified that this project report titled "**IOT BASED SMART GARBAGE MONITORING AND CONTROLLING SYSTEM**" is the bonafide work of **Mr. SUDEEP.J (731221401004)** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

U.SASIKALA,AP/ECE	**Mr.C.Murugesan M.E.,(Ph.D) .,**
ASSISTANT PROFESSOR	ECE HEAD OFDEPARTMENT
Department of Electronics and	Department of Electronics and
Communication Engineering	Communication Engineering
J K K Munirajah College of	J K K Munirajah College of
Technology , T.N.Palayam	Technology,T.N.Palayam

Submitted for the project Viva-Voice Examination held on: 9-10-2023

Internal Examiner

External Examiner

PRINCIPAL
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ABSTRACT

The Internet of Things (IoT) shall be able to incorporate transparently and seamlessly a large number of different and heterogeneous end systems, while providing open access to selected subsets of data for the development of a plethora of digital services. One of the main concerns with our environment has been solid waste management which in addition to disturbing the balance of the environment also has adverse effects on the health of the society. The detection, monitoring and management of wastes is one of the primary problems of the present era. The traditional way of manually monitoring the wastes in waste bins is a complex, cumbersome process and utilizes more human effort, time and cost which is not compatible with the present day technologies in any way. This an advanced method in which waste management is automated. This project IoT Garbage Monitoring system is a very innovative system which will help to keep the cities clean. This system monitors the garbage bins and informs about the level of garbage collected in the garbage bins via a web page. This web page also sends all information to garbage collection vehicles.

6. CONCLUSION

To conclude from the researches carried out on waste management worldwide, the garbage needs to be segregated and then disposed appropriately. This can help in reducing huge pyramids forming at the garbage dumping grounds.

This model segregates the litter effectively from its source itself. This will help to cut down the tedious and monotonous process of the waste segregation. This system integrates for garbage monitoring and collection in a way which enables optimum use of resources. The system proposes a real time optimum solution for a tiresome problem of junk management. The system improves the garbage management by reducing the possibility of spill over of rubbish in cities.

The system also provides a broader overview of scrap generation pattern of the city which further can be utilized for better planning of waste management by centrally providing the real time scenario of any locality where the system is employed.

6.1. FUTURE WORK

In future, the data can be enhanced, that is stored on the server helps to compute the optimized collection routes for the collector. The scope for future work is the implementation of same system with less complexity at affordable costs and more security to the sensors so its life is increased.

AP4251 **INDUSTRIAL INTERNET OF THINGS** L T P C
3 0 0 3

COURSE OBJECTIVES:

- To understand the fundamentals of Internet of Things
- To learn about the basics of IOT protocols
- To build a small low cost embedded system using IoT
- To apply the concept of I0T in the real world scenario

UNIT I INTRODUCTION AND ARCHITECTURE OF IoT 9

Introduction – Definition and characteristics of IoT – Physical and Logical Design of IoT - Communication models and APIs - Challenges in IoT - Evolution of IoT- Components of IoT - A Simplified IoT Architecture - Core IoT Functional Stack.

UNIT II INDUSTRIAL IoT 9

IIoT-Introduction, Industrial IoT: Business Model and Reference Architecture: IIoT-Business Models, Industrial IoT- Layers: IIoT Sensing, IIoT Processing, IIoT Communication, IIoT Networking

UNIT III IIOT ANALYTICS 9

Big Data Analytics and Software Defined Networks, Machine Learning and Data Science, Julia Programming, Data Management with Hadoop

UNIT IV IOT SECURITY 9

Industrial IoT: Security and Fog Computing - Cloud Computing in IIoT, Fog Computing in IIoT, Security in IIoT

UNIT V CASE STUDY 9

Industrial IOT- Application Domains: Oil, chemical and pharmaceutical industry, Applications of UAVs in Industries, Real case studies: Milk Processing and Packaging Industries, Manufacturing Industries

TOTAL : 45 PERIODS

COURSE OUTCOMES:

Upon completion of this course, student will be able to

CO1: Understand the basic concepts and Architectures of Internet of Things.
CO2: Understand various IoT Layers and their relative importance.
CO3: Realize the importance of Data Analytics in IoT.
CO4: Study various IoT platforms and Security
CO5: Understand the concepts of Design Thinking.

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IOT-BASED WEARABLE FALL PREDICTION AND DETECTION SYSTEM

PHASE II REPORT

Submitted by

DIVYA.R

(731221401001)

in partial fulfillment for the award of the degree

of

MASTER OF ENGINEERING

In

APPLIED ELECTRONICS

J.K.K MUNIRAJAH COLLEGE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

T.N PALAYAM

ANNA UIVERSITY, CHENNAI-600 025

OCTOBER 2023

PRINCIPAL
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T.N. PALAYAM (Po)-638 506.
GOBI (Tk), ERODE (Dt).

BONAFIDE CERTIFICATE

Certified that this project report titled "IOT-BASED WEARABLE FALL PREDICTION AND DETECTION SYSTEM" is the bonafide work of Ms. DIVYA.R (731221401001) who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

U.Sasikala,AP/ECE	Mr.C.Murugesan M.E.,(Ph.D) .,
ASSISTANT PROFESSOR	ECE HEAD OF DEPARTMENT
Department of Electronics and	Department of Electronics and
Communication Engineering	Communication Engineering
J K K Munirajah College of	J K K Munirajah College of
Technology , T.N.Palayam	Technology,T.N.Palayam

Submitted for the project Viva-Voice Examination held on: 9.10.2023

Internal Examiner

External Examiner

PRINCIPAL
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GOBI (Tk), ERODE (Dt).

ABSTRACT

In fact, falls exponentially increase with age-related biological changes, which is leading to a high incidence of falls and fall related injuries in the aging societies. In this context, assist device that could help to alleviate this major health problem are a social necessity. Most traditional medical alert monitoring systems rely on a pendant or button that your loved one must press in order to call for help. These systems are highly effective and save lives every day. Some seniors, though, are at a higher risk of falling than others. There is the possibility that when your loved one falls, they may be unable to press their medical alert button to call for help. This is where Automatic Fall Detection comes in. The benefits of automatic fall detection to seniors can be great. Also, if you or your loved one has diabetes or another condition that increases your risk of falling, this feature might provide you with additional piece of mind. If your loved one sustains an injury or becomes unconscious from a fall and they are alone, their chance of getting help fast is increased significantly by automatic fall detection technology.

6. CONCLUSION

The patient fall detection and heart stroke prediction system has been proposed in this paper. By using various sensors, the system has measured heartpulse rate, body temperature, relative humidity and position of the patient. Any abnormalities were detected in the accleration sensors , the system will produce alert to caregivers through IoT technology. The other parameters like body temperature, relative humidity and heart pulse rate is quantitatively analyzed with the resk data sent and the probability of heart stroke is measured by using machine learning algorithm. This alert and verified data send to the hospital , doctors and caregivers through IoT Cloud channel. After the alert, is very much helpful for quick recovery and standard the treatment. Our proposed system are very efficient and high accuracy of detection is observed.

INTERNSHIP

AP4153 **SEMICONDUCTOR DEVICES AND MODELING** **L T P C**
3 0 0 3

COURSE OBJECTIVES:

- To acquire the fundamental knowledge and to expose to the field of semiconductor theory and devices and their applications.
- To gain adequate understanding of semiconductor device modelling aspects, designing devices for electronic applications
- To acquire the fundamental knowledge of different semiconductor device modelling aspects.

UNIT I MOS CAPACITORS **9**

Surface Potential: Accumulation, Depletion, and Inversion, Electrostatic Potential and Charge Distribution in Silicon, Capacitances in an MOS Structure, Polysilicon-Gate Work Function and Depletion Effects, MOS under Nonequilibrium and Gated Diodes, Charge in Silicon Dioxide and at the Silicon-OxideInterface, Effect of Interface Traps and Oxide Charge on Device Characteristics, High-Field Effects, Impact Ionization and Avalanche Breakdown, Band-to-Band Tunneling, Tunneling into and through Silicon Dioxide, Injection of Hot Carriers from Silicon into Silicon Dioxide, High-Field Effects in Gated Diodes, Dielectric Breakdown.

UNIT II MOSFET DEVICES **9**

Long-Channel MOSFETs, Drain-Current Model, MOSFET I-V Characteristics, Subthreshold Characteristics, Substrate Bias and Temperature Dependence of Threshold Voltage, MOSFET Channel Mobility, MOSFET Capacitances and Inversion-Layer Capacitance Effect, Short-Channel MOSFETs, Short-Channel Effect, Velocity Saturation and High-Field Transport Channel Length Modulation, Source-Drain Series Resistance, MOSFET Degradation and Breakdown at High Fields

UNIT III CMOS DEVICE DESIGN **9**

CMOS Scaling, Constant-Field Scaling, Generalized Scaling, Nonscaling Effects, Threshold Voltage, Threshold-Voltage Requirement, Channel Profile Design, Nonuniform Doping, Quantum Effect on Threshold Voltage, Discrete Dopant Effects on Threshold Voltage, MOSFET Channel Length, Various Definitions of Channel Length, Extraction of the Effective Channel Length, Physical Meaning of Effective Channel Length, Extraction of Channel Length by C-V Measurements.

UNIT IV BIPOLAR DEVICES **9**

n-p-n Transistors, Basic Operation of a Bipolar Transistor, Modifying the Simple Diode Theory for Describing Bipolar Transistors, Ideal Current-Voltage Characteristics, Collector Current, Base Current, Current Gains, Ideal IC-VCE Characteristics, Characteristics of a Typical n-p-n Transistor, Effect of Emitter and Base Series Resistances, Effect of Base-Collector Voltage on Collector Current, Collector Current Falloff at High Currents, Nonideal Base Current at Low Currents, Bipolar Device Models for Circuit and Time-Dependent Analyses Basic dc Model, Basic ac Model, Small-Signal Equivalent-Circuit Model, Emitter Diffusion Capacitance, Charge-Control Analysis, Breakdown Voltages, Common-Base Current Gain in the Presence of Base-Collector Junction Avalanche, Saturation Currents in a Transistor.

UNIT V MATHEMATICAL TECHNIQUES FOR DEVICE SIMULATIONS **9**

Poisson equation, continuity equation, drift-diffusion equation, Schrodinger equation, hydrodynamic equations, trap rate, finite difference solutions to these equations in 1D and 2D space, grid

generation.

TOTAL: 45 PERIODS

COURSE OUTCOMES:

Upon completion of this course, the students will be able to

CO1: Explore the properties of MOS capacitors.

CO2: Analyze the various characteristics of MOSFET devices.

CO3: Describe the various CMOS design parameters and their impact on performance of thedevice.

CO4: Discuss the device level characteristics of BJT transistors.

CO5: Identify the suitable mathematical technique for simulation.

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SMART BAND FOR MONITORING HEALTH USING IOT DEVICE

PHASE II REPORT

Submitted by

SEETHASUGANTHI.S

(731221401002)

in partial fulfillment for the award of the degree

of

MASTER OF ENGINEERING

In

APPLIED ELECTRONICS

J.K.K MUNIRAJAH COLLEGE OF TECHNOLOGY

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

T.N PALAYAM

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OCTOBER 2023

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GOBI (Tk), ERODE (Dt).

BONAFIDE CERTIFICATE

Certified that this project report titled "**SMART BAND FOR MONITORING HEALTH USING IOT DEVICE**" is the bonafide work of **Ms. SEETHASUGANTHI.S (731221401002)** who carried out the research under my supervision. Certified further, that to the best of my knowledge the work reported herein does not form part of any other project report or dissertation on the basis of which a degree or award was conferred on an earlier occasion on this or any other candidate.

R.Kokila, AP/ECE
ASSISTANT PROFESSOR
Department of Electronics and Communication Engineering
J K K Munirajah College of Technology , T.N.Palayam

Dr.C.Murugesan M.E.,Ph.D .,
HEAD OF DEPARTMENT
Department of Electronics and Communication Engineering
J K K Munirajah College of Technology,T.N.Palayam

Submitted for the project Viva-Voice Examination held on: 9.10.2023

Internal Examiner

External Examiner

PRINCIPAL
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ABSTRACT

Today, the humans are completely dependent on technology and are struggling hard to make it more advanced. People have made their life more complex and busy. In their busy schedule they don't bother for their health. Hence, we have developed a project titled "Smart Health Band". The purpose of this project is to autonomously monitor the health of the person. This health band can sense body temperature and pulse rate of a person. Upon sensing the temperature and pulse rate, the data is to be sent to a cloud. Here, a graph displays the sensed temperature and pulse rate. This data is then fetched on a mobile application. Hence, user can see the pulse rate and body temperature by using the application. In critical condition, if the pulse rate drastically increases/decreases above or below the threshold value, then a notification will be sent to the doctor. Smart Health Band is constructed with the help of Arduino Uno, pulse sensor, temperature sensor, Wi-Fi module, batteries and Velcro Tape to be mounted on. This project intends to decrease the death rates which occur due to the heart attack or heart related issues.

6. CONCLUSION:

This paper is based on our project for the final year of engineering. Being an application of Internet of Things (IoT), this project proves to be an autonomous health monitoring system. The said project is able to continuously sense pulse rate and body temperature of the person wearing the band. The project can be further extended to create a whole new system of connected smart health bands so that everyone will be monitored and given proper treatment at right time. With more advanced and reliable sensors, the health band can be more efficient. This project can be a life saying band for people who do not have sufficient time to take care of their health or people who live alone and do not have someone to look after.

Gmail

ELECTRONICS COMMUNICATION <jkkmctece2013@gmail.com>

INTERNSHIP REQUISITION

2 messages

ELECTRONICS COMMUNICATION <jkkmctece2013@gmail.com> Fri, Apr 21, 2023 at 10:05 AM
To: power supplies <gbro@gmail.com>

Sir,

On behalf of J.K.K.Munirajah College of Technology, we wish to request for permission to do Project Internship training at your company Universal Power supplies.

We wish to undertake our students a Project Internship training at your company from 01.05.23 onwards upto two months to complete their project. As per the curriculum, the student needs to join a two month long internship and attain a certificate after satisfactory training. It will be a golden opportunity for the students as they will get to learn a lot of new things. We believe that your company will give relevant knowledge and training during this internship to complete their project.

Our student S.Seethasuganthi is intend to participate in this Project Internship. Please allow our student to do Project Internship at your company and meet your skilled employee. Thank you in advance.

With Regards,
HoD/ECE

ECE DEPARTMENT

ECLON WELCOMES U ALL..

INTERNSHIP.pdf
142K

power supplies <gbro@gmail.com> Mon, Apr 24, 2023 at 10:05 AM
To: ELECTRONICS COMMUNICATION <jkkmctece2013@gmail.com>

Dear Sir,
With great pleasure we welcome the listed student from your attached letter, to do project internship training in our company from 01.05.2023 onwards.

Best Regards,
UPS

UNIVERSAL POWER SUPPLIES

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JKK MUNIRAJAH COLLEGE
OF TECHNOLOGY
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UNIVERSAL POWER SUPPLIES

Department of R & D Centre,
Varanapuram, Bhavani, Tamil Nadu 638301

Phone: 099421 07795
Website: www.gbro.in

Date: 30.06.2023

TO WHOMSOEVER IT MAY CONCERN

This is to certify that the student **Ms.S.SEETHASUGANTHI (Reg. No: 731221401002)** M.E.-Applied Electronics Second Year from J.K.K.Munirajah College of Technology, T.N.Palayam, Gobi, has satisfactorily completed her Internship during the period of 01.05.2023 to 30.06.2023.

She worked on the project titled **"SMART BAND FOR MONITORING HEALTH USING IOT DEVICE"** under our guidance.

During the above mentioned period her conduct and behavior remains good, We wish her all the best for future.

For

Electronics R & D Manufacturing
Universal Power Supplies

Project Manager
UNIVERSAL POWER SUPPLIES
Opp. Bhavani G.H.,
Bhavani - 638 301.
Contact : 88833 96669

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