



SRI RAAJA RAAJAN COLLEGE OF ENGINEERING AND TECHNOLOGY

(Approved by AICTE, New Delhi & Affiliated to Anna University)

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FUNDED PROJECT

ACADEMIC YEAR(2020-2021)

AUTOMATIC LIGHTING SYSTEM USING ARDUINO AND PIR SENSOR

REPORT

The final year students of Electronics & Communication Engineering came up with an idea of "Automatic Lighting System using Arduino and PIR Sensor. This project was greatly appreciated and funded by the ezone-Project Development and Training with whom we have signed Memorandum of Understanding (MOU) for the academic year 2020-2021. This Project was presented before our Chairman Dr.S.Subbiah Former & Vice chancellor of Alagappa University & Principal Dr.Mayilvahanan AL, M.E., Ph.D., & Mr. Gopi krishnan Founder & CEO of ezone Project Development and Training. Our final Year Abinaya S, Ahitha R, Sangeetha S, Sutha S carried out this project under the guidance of Mrs. Isabellarani K Assistant Professor, Electronics & Communication Engineering.

In this project, Automatic Lights using Arduino and PIR Sensor, where the lights in the room will automatically turn ON and OFF by detecting the presence of a human. Also, with the help of an automatic room light control system, you need not worry about electricity as the lights get automatically off when there is no person. Automatic Room Lights System using Arduino is a very useful project as you need not worry about turning on and off the switches every time you want to turn on the lights. The main components of the Automatic Room Lights project are Arduino, PIR Sensor and the Relay Module. Out of the three components, the PIR Sensor is the one in focus as it is the main device that helps in detecting humans and human motion. Initially, when there is no human movement, the PIR Sensor doesn't detect any person and its output pin stays low. As the person enters the room, the change in infrared radiation in the room is detected by the PIR Sensor.

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INTRODUCTION

Intelligent Energy Saving System, the aim of the project is to save the energy. In this Project we are using various sensors, controlling display. However, in this project work the basic signal processing of various parameters which are temperature, PIR smoke sensors. For measuring various parameters values, various sensors are used and the output of these sensors are converted to control the parameters. The control circuit is designed using micro-controller.

The outputs of all three parameters are fed to micro-controller. The output of micro-controller is used to drive the LCD display, so that the value of each parameter can be displayed. In addition to the LCD display micro controller outputs are also used drive a relay independently. This relay energizes and deenergizes automatically according to the condition of parameter.

Conservation of energy is an important topic in the current research lighting system plays vital role in homes, offices, industrial sectors, urban and rural areas. For longer efficiency and to reduce the power consumption many methods have been developed. They have already installed lighting of different method which are outdated and energy inefficient. For smart lighting and to reduce the energy storage equipment, light emitting diodes (LED) and hybrid power system can be used.

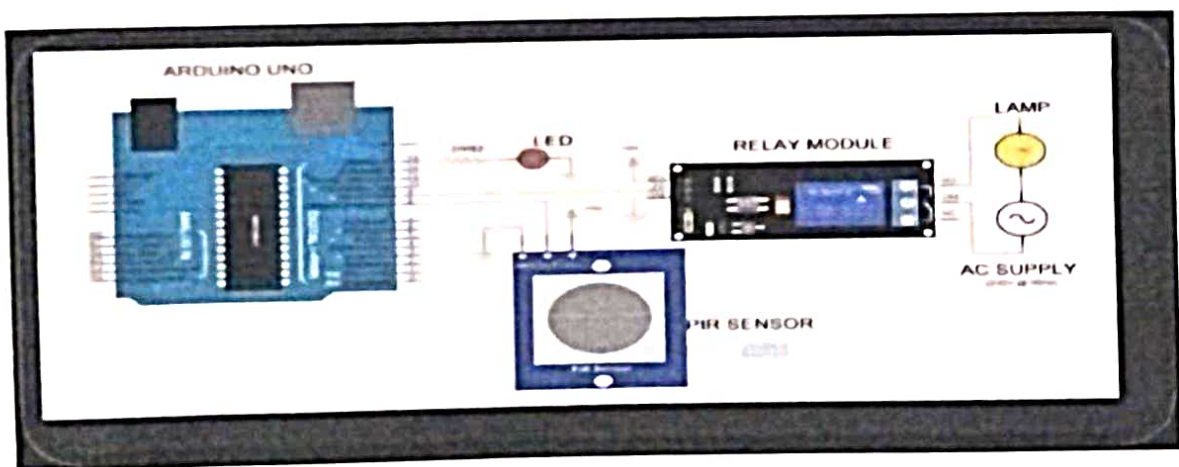
Here this project gives a review on the available smart lighting systems and it also gives a review on the available smart lighting systems and it also gives the idea to develop low cost, adaptable, easy to install, wireless sensor based smart lighting system which automatically adjust the intensity of light for energy saving which satisfies the user.




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power or saving our generated power. PIR is the type of sensor that gives us signal when anything crosses its rays. It is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. It is a low-cost device used to detect a change in motion in its surroundings within different range of radius. A PIR-based motion detector is used to sense movement of people, animals, or other objects. It can also be helpful in the security systems. In many offices there are pavements where lights kept switched on for the whole night and day. But if we use the sensor then only when it gets motion it will give signal and the lights will be switched on. The whole process can be controlled by using microcontroller. Using the received motion from any movements, the PIR sensor gives high signal to the microcontroller. So we can easily create a program for the microcontroller for setting up an alarm. So this project is very lower costing and also power saving. It also minimizes the electric bills of any office.

CIRCUIT DIAGRAM



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COMPONENTS REQUIRED

- ❖ Pir sensor.
- ❖ Arduino uno.
- ❖ 12v relay.
- ❖ 12 v dc power supply.
- ❖ Connecting wires.

ARDUINO UNO

- Arduino Uno is a microcontroller board based on the ATmega328P.
- It has 14 digital input/output pins.
- 6 analog inputs, a 16 MHz ceramic resonator (CSTCE16M0V53-R0).
- USB connection, a power jack, an ICSP header and a reset button.
- It contains everything needed to support the microcontroller; simply connect it to a computer with a USB cable or power it with a AC-to-DC adapter or battery to get started

PIR SENSOR



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A passive infrared sensor (PIR sensor) is an electronic sensor that measures infrared (IR) light radiating from objects in its field of view. They are most often used in PIR-based motion detectors.

RELAY MODULE

A Relay Module is a very useful component as it allows Arduino, Raspberry Pi or other Microcontrollers to control big electrical loads. We have used a 2-channel Relay Module in this project but used only one relay in it.

ADVANTAGES

- ❖ Managing all of your home devices from one place.
- ❖ Flexibility for new devices and appliances.
- ❖ Maximizing home security.
- ❖ Remote control of home functions.
- ❖ Increased energy efficiency.
- ❖ Improved appliance functionality.
- ❖ Home management insights.

CONCLUSION

From this project we conclude that an approach is taken to control automatic light with the help of various devices and the user was



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informed about the entry of the person through a PIR SENSOR at the receiver.

RESULT AND OUTPUT

This idea of automated lighting system has proposed a method which saves power consumption by system. This automated system having the interconnection between the home appliances and sensors for controlling and monitoring the devices.

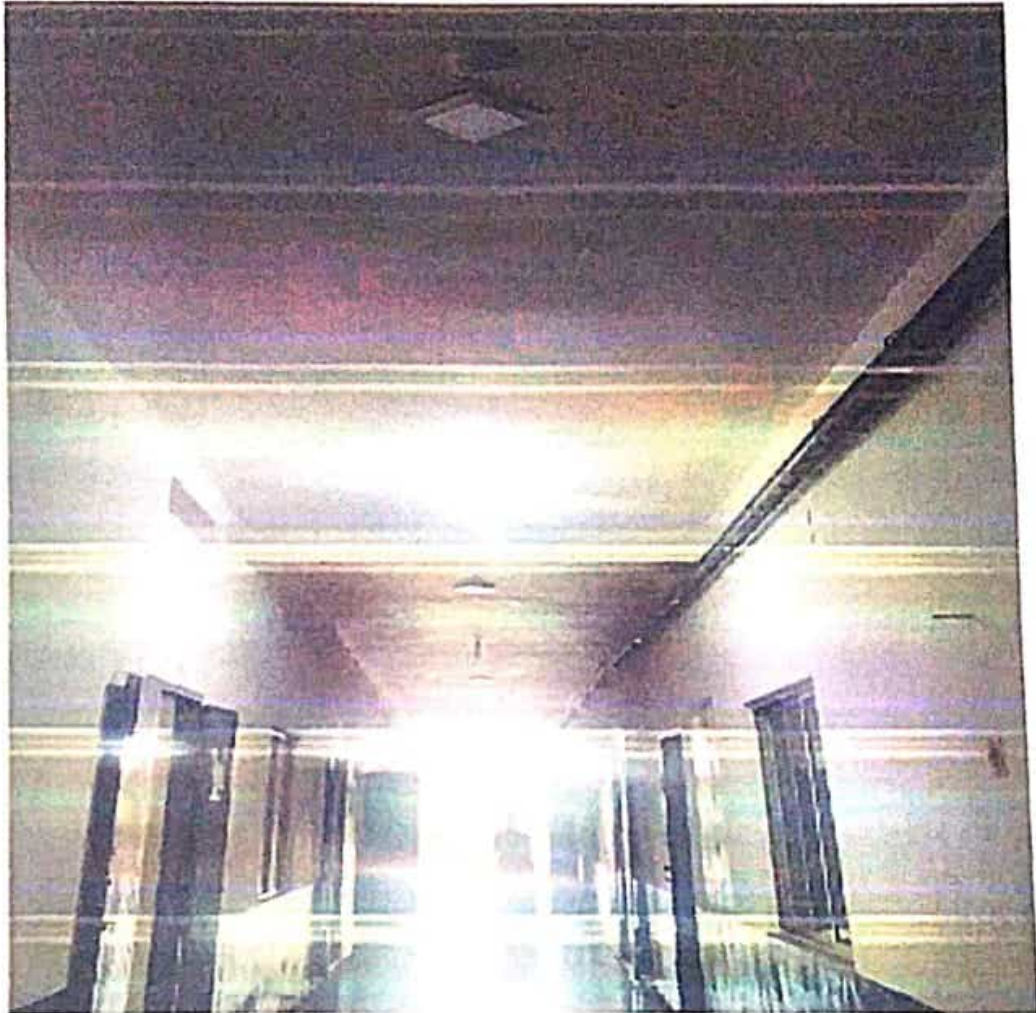


Output:- Automatic Lighting System Using Arduino and PIR Sensor.



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This project was funded by e zone project Development and Training with whom the institution has signed Memorandum of Understanding (MoU) for the academic year 2019-2020. The assembly and fabrication cost was incurred by the project students.

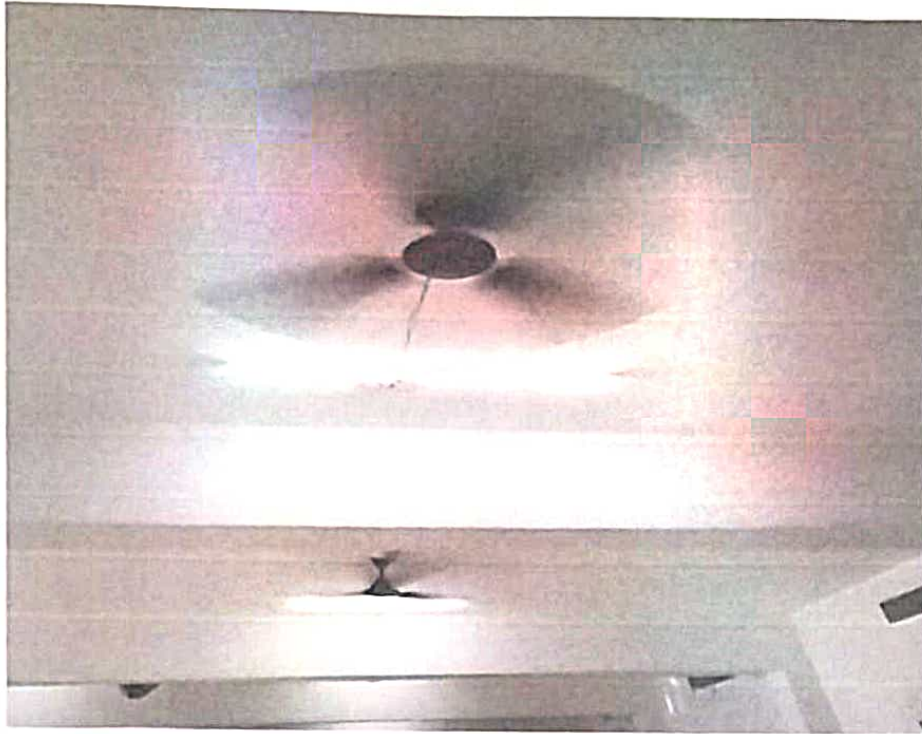


Automatic Detection of Human using PIR Sensor




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Automatic Detection of Human using PIR sensors.

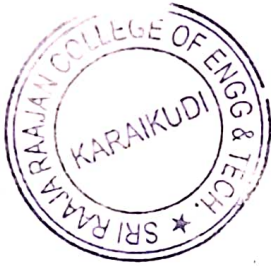



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FUNDED PROJECT
AUTOMATIC LIGHTING SYSTEM USING ARDUINO AND PIR SENSOR
ACADEMIC YEAR (2020-2021)

EXPENDITURE DETAILS

BILL NO:1 SURFACE PANEL LOGHT	-Rs.10,800/-
BILL NO:2 sds 6*110 Dewalt & 8*110 Dewalt	-Rs.180/-
BILL NO:3 PIR Motion Sensor with Light Sensor, Energy Saving Motion Detector switch	-Rs.5860/-
BILL No:4 Surface Ceiling Lights with IC Driver Energy Saver	-Rs.3755/-
TOTAL COST FOR THIS PROJECT	- Rs. 20595/-



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DEVAYANAI TRADERS

FIVE LAMPS, 208 SEKKALI ROAD

KARAIKUDI-630 001

94435 02087

GSTIN : 33EYMPS4087R1Z9

To,

TAX INVOICE CASH BILLInvoice No: **11618**Invoice Date: **26-03-2021**

SNo	DESCRIPTION OF GOODS	HSN/SAC	QTY	RATE	GST%	AMOUNT	
1	sds 6x110 Dewalt	8467	1.00 pcs	72.04	18	72.04	
2	sds 8x110 Dewalt	8467	1.00 pcs	80.51	18	80.51	
GST% Taxable Value CGST% CGST Amt SGST% SGST Amt GROSS AMOUNT						152.55	
0%						ADD. CGST AMOUNT	13.73
5%		2.5%		2.5%		ADD. SGST AMOUNT	13.73
12%		6%		6%			
18%	152.55	9%	13.73	9%	13.73		
Total	152.55		13.73		13.73	ROUNDED OFF	-0.01
Rupees One Hundred Eighty Only.						TOTAL AMOUNT	180.00
Receiver's Signature						For DEVAYANAI TRADERS	




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Sold By :

BLACKT ELECTROTECH

* Sy No. 524/1,2,3,4,6, 525/1,2,3,4,5,6,
526/3,4,5,6,527 of madivala village, and Sy
no.51/1 of thatanahalli village, kasaba hobli,
anekal taluk, Bangalore urban district
Bangalore, Kamataka, 562107
IN

Billing Address :

Arun kumar
8/121, Gandhinagar
TIRUVADANAI, TAMIL NADU, 623531
IN
State/UT Code: 33

PAN No: BWNPD2719K

GST Registration No: 29BWNPD2719K1Z6

Shipping Address :

Arun kumar
Arun kumar
8/121, Gandhinagar
TIRUVADANAI, TAMIL NADU, 623531
IN
State/UT Code: 33

Place of supply: TAMIL NADU

Place of delivery: TAMIL NADU

Invoice Number : IN-BLR7-12723

Invoice Details : KA-BLR7-141883061-2021

Invoice Date : 18.03.2021

Order Number: 171-4626820-7099555

Order Date: 18.03.2021

Sl. No	Description	Unit Price	Discount	Qty	Net Amount	Tax Rate	Tax Type	Tax Amount	Total Amount
1	Blackt Electrotech (BT31C): 360 Degree PIR Motion Sensor with Light Sensor, Energy Saving Motion Detector Switch with 18 Months Warranty (Ceiling Mounted) B0143JR3MG (BT31C) HSN.8541	₹496.61	₹0.00	10	₹4,966.10	18%	IGST	₹893.90	₹5,860.00
	Shipping Charges	₹33.90	-₹33.90		₹0.00	18%	IGST	₹0.00	₹0.00
TOTAL:								₹893.90	₹5,860.00

Amount in Words:

Five Thousand Eight Hundred Sixty only

For BLACKT ELECTROTECH:

(Signature)

Authorized Signatory

Whether tax is payable under reverse charge - No



(Signature)

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Sold By :
DMAK ENERGIA PVT. LTD
* B-123/2, Electronics Zone, Sector 25 GIDC
GANDHINAGAR, GUJARAT, 382024
IN

Billing Address :
Arun kumar
8/121, Gandhinagar
TIRUVADANAI, TAMIL NADU, 623531
IN
State/UT Code: 33

PAN No: AAHCD7747F
GST Registration No: 24AAHCD7747F1ZK

Shipping Address :
Arun kumar
Arun kumar
8/121, Gandhinagar
TIRUVADANAI, TAMIL NADU, 623531
IN
State/UT Code: 33

Place of supply: TAMIL NADU
Place of delivery: TAMIL NADU

Order Number: 171-0204038-8431509
Order Date: 22.03.2021

Invoice Number : IN-44826
Invoice Details : GJ-165616131-2021
Invoice Date : 22.03.2021

Sl. No	Description	Unit Price	Qty	Net Amount	Tax Rate	Tax Type	Tax Amount	Total Amount
1	DMak 22W LED Surface Ceiling Lights With Ic Driver Energy Saver Dust Proof, White, Square B07N2VFYLV (71-ODQ4-QWGE)	₹ 3,352.68	1	₹ 3,352.68	12%	IGST	₹ 402.32	₹ 3,755.00
TOTAL:							₹ 402.32	₹ 3,755.00

Amount in Words:
Three Thousand Seven Hundred Fifty-five only

For DMAK ENERGIA PVT. LTD:

Authorized Signatory

Whether tax is payable under reverse charge - No



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SINCE : 2012

The Beacon of electronics

Project Development and Training

Memorandum of Understanding

This is to certify that the Memorandum of Understanding (MOU) is made on 6th of September 2019.

BETWEEN

E ZONE ELECTRONICS, a Graphic Designing , Product Development , Business Management Firm, with its head office located at 10, 2nd Floor, Rangaa Complex Landmark: Near Ramba Theatre), Chathiram Bus Stand, Trichy - 620002 Chathiram Bus Stand, Tamil Nadu 620002 District, represented by its Founder and CEO, Mr.GOPI KRISHNAN.

AND

Sri Raaja Raajan College of Engineering and Technology, Karaikudi hereinafter Referred as "SRR CET", located at "Karaikudi, Sivaganga District, Tamilnadu", recognized by AICTE and Anna University, offering Quality Education and Philanthropy, represented by its Department Head Mrs. K.ISABELLA RANI on the date 6-SEP-2019 has been signed off and both the parties agree to adhere to the MOU.

The details of the above said MOU are as follows:



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Objective :

To set up a Arduino and IOT Development Center at SRRCET, ECE Lab

Purpose :

- (a) To impart technical knowledge and skills for the students and Faculty of SRRCET through Internships, Live Industrial Projects/Case Studies, Training, Workshops etc.,
- (b) To create a bridge to reduce the gap between Industries and Institutions.
- (c) To Develop Products and Solutions for Projects.

Validity : 3 Years from the date of MOU.

1.1.E ZONE ELECTRONICS: Setting up a development center at SRRCET ECE Lab.

- a) Creating awareness about the latest technologies, trends and employability /entrepreneurship skills needed to the students of SRRCET.
- b) Hiring and deploying the students of SRRCET for Internships.
- c) Offer Live Industrial Projects to the willing students, as per the company norms.
- d) Felicitate set up of a TBI, with multiple Companies Centers, if required for SRRCET.
- e) Provide Student Development and Faculty Development Programs, whenever possible.
- f) Carry out Development activities that result in Mutual Growth for both E ZONE ELECTRONICS and SRRCET. ✓
- g) Felicitate Industrial Expertise Interaction SRRCET Innovation activities, wherever possible.
- h) Mentor the students and Faculty for converting their Creative Ideas into Products.

1.2 Sri Raaja Raajan College of Engineering and Technology, Karaikudi (SRRCET)

- a. Provide Infrastructure support to E ZONE ELECTRONICS, based on the listed down requirements.
- b. Appoint Dept Coordinator/Course Head for Continuous Coordination, Implementation and Execution of this MOU.



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- c. Provide minimum 10 interns, and also permit other Interns to utilize the center, when required.
- d. Promote the need of having hands on Experience in Live Projects, Industrial Advancements for the students, in order to get their technical skills and Entrepreneurial Skills upgraded.
- e. Promote Faculty to get latest insights about the Industrial sector through FDP Programs, and give preference to Industrial Projects.
- f. Utilize the E ZONE ELECTRONICS Development Center for Innovation Initiatives of SRRCET, its Faculty and Students.
- g. Provide Boarding and Lodging for E ZONE ELECTRONICS Personnel during their Visits/Stay at the Development Center.
- h. Promote the culture of taking up challenges to the students, to have their development and progress.
- i. Utilize the E ZONE ELECTRONICS Development Center for creation and implementation of new innovative ideas for the development of individuals, Institution and the nation.
- j. Insist the need of Innovation, Entrepreneurship, Learning and Implementing Advanced Technologies, Development of Solutions/Products along with Quality Education to the students of SRRCET.
- k. Ensure discipline, ethical behavior of the personnel utilizing the development center for growth.

2. Infrastructure Requirements to be provided by SRRCET:

- a) Work space of minimum 300 sq ft/ 30 sq .m with provision for Displaying E ZONE ELECTRONICS Name board and Center details, One Shelf and required Stationery.
- b) Minimum of 5Desktops/Laptops, uninterrupted power supply (Existing Systems from Labs can be used on Sharing basis).
- c) IoT software platform must be flexible enough to support different communication protocols (MQTT, REST, XMPP, WebSockets, etc.)

Required things:

Arduino UNO or Compatible Board, USB Power Cable, Resistor 220 ohms, Resistor 10K Ohms, Resistor 1K Ohms, Breadboard, Tricolor LED Common Cathode, Red LED Common Cathode, Seven segment display - Common cathode, Seven segment display - Common anode, Decoder – IC 7447, LCD 16 X 2

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soldered with pin header, Jumper wires Male to Male, Jumper wires Male to Female, Potentiometer 10K Ohms, ESP8266 es01 WiFi Black color Module, DHT11 Temp Humidity Sensor Module, L293D H-Bridge Motor driver IC, Toy Motor , Buzzer, Push Button Switch.

- d) Support to install any additional software tools required for the development center.
- e) Provide necessary support in the PLM Cycle of E ZONE ELECTRONICS Products/Solutions.

3. Activities to be carried out by E ZONE ELECTRONICS as part of MOU.

- Internships and Training for Interns.
- Industrial Awareness for Students and Faculty.
- Insights about Latest Technology and Industrial Trends to create awareness.
- Support in creative ideas, Innovation activities of SRR CET and Patent/PR support.
- Live Industrial Projects/Case Studies and working experience.
- Carry out Product/Solution development at the center.
- Provide Placement for Students.

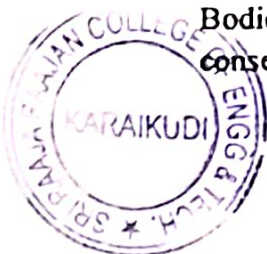
4. Financials:

This MOU does not cover any financial liabilities on both the parties.

In case of any additional services needed by SRR CET, apart from the above indicated ones, the charges will be mutually discussed and agreed on a case-to case basis. The charges, if any, are subject to the applicable taxes and necessary supporting bills should be accompanied.

5. Non-Disclosure and Confidentiality:

By signing on this MOU, both the parties agree that confidential information about both the parties, will never be disclosed by any one of the parties, to any third party without the consent of the other party. Also, this document is confidential and both the parties can utilize it only for the purpose of Accreditation/ Recognition/ Incorporation from any professional/ Government Bodies only. Any other usage apart from the above has to be done with the written consent of the other party.



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6. Termination:

Both bodies can mutually terminate this MOU, with a prior written notice of 6 months. Upon termination both the parties shall return the infrastructure/ confidential information/ any other tools/programs to each other.

7. Renewal of MOU:

The MOU can be renewed upon its expiry for an additional period of 1 to 3 years, based on mutual agreement between both the parties.

8. Annexure to MOU

Through Annexure to this MOU, both the parties can perform below activities.

- a. Add any additional services, based on mutual agreement between both parties.
- b. List down the details of the Development activities.
- c. Indicate any activities that are being carried out (Non-Commercial or Commercial) with specific details.

9. Jurisdiction:

This MOU falls under the jurisdiction of the courts in Sivagangai, Tamilnadu , India.



For E ZONE ELECTRONICS

Mr. GOPI KRISHNAN



For SRR CET


MR. K. ISABELLA RANI
ECE



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Witness:

1. 

2. 

Witness:

1. 

2. 

Annexure 1 to MOU dated 6-SEP-2019 between E ZONE ELECTRONICS and SRR CET:

E ZONE ELECTRONICS Projects Planned for Development 2019-2022

The E ZONE builds various pillars which hold the future India in the place high above in the international forum. The pillars are:

1. E ZONE educational institution.
2. E ZONE PCB manufacture division
3. EMBEDDED SYSTEMS Projects
4. ROBOTICS Projects
5. MECHANICAL Projects
6. AUTOMOBILE Projects
7. MATLAB Projects
8. POWER ELECTRONICS Projects
9. VLSI & LABVIEW Projects
10. CAD & CAM & CAE Projects
11. ANDROID & IOSJAVA.NET Projects



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