K.S.R. COLLEGE OF ENGINEERING

(An Autonomous Institution)

Tiruchengode, Tamil Nadu – 637 215.

Event Schedule

1	Name of the Event (Seminar/Workshop/Conference/FDP /Any other)	Value added course
2	Name of the Organizer	EEE Department
3	Date of Event	13.02.2020 to 15.02.2020
4	Platform	Offline
5	Title of the Event	Value added course on Design of PCB using Photoresist Method
6	Name of the Co-ordinators	Dr.R.Sankarganesh Dr.M.Ramasamy Mr.J.Thiyagarajan
7	Total Participants	35
8	Objectives of the Event	To be successful completion of event the participants have gained knowledge and develop skill to Design of Printed Circuit Board.

CO-ORDINATOR

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TIRUCHENGODE-637 215

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Tiruchengode, Tamil Nadu – 637 215.

Report for Value added course on Design of PCB using Photoresist Method

(13.02.2020 to 15.02.2020)

K.S.R.College of Engineering, Department of Electrical and Electronics Engineering conducted Value added course on Design of PCB using Photoresist Method. This programme was presided over by our Principal Dr.P.Senthilkumar and Dr.S.Ramesh,HoD/EEE.

Value added course on Design of PCB using Photoresist Method was organized by department of Electrical and Electronics Engineering hands on with Mr.T.Anand, Innospace Automation Services Pvt. Ltd, Chennai was the resource person of this programme.

Department for successfully organizing the PCB course and Most designs begin with a hand drawn schematic and design plan. With these, the circuit is prototyped and tested to verify that the design works correctly. Then, using software, an electronic version of the schematic is created. A net list file is created from the electronic schematic and used in other software to create the physical layout of the PCB. Next, the components are placed and routed in the physical layout software and Gerber files are created. These Gerber files are used in a prototyping system to mill, drill, and cut the PCB substrate. The components are then placed and soldered to the substrate. Finally, the students are developed skill to design the board and tested.

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Value Added Course (VAC) on Design of PCB using Photo Resist Method

13th February 2020 - 15th February 2020

Programme Schedule

Day	Session	Time	Topics to be Covered
Day 1	Session 1	09.00 AM to 10.40 AM	**Circuit diagram design** i. Design a circuit and test the circuit with bread board. ii. Check all the voltage and current of the designed circuit and it is noted iii. Draw the complete designed circuit diagram in a new sheet
	Session 2	10.50 am to 12.30 PM	**Eagle CAD installation** i. Install the eagle CAD software which is given ii. Copy the crack file to the install directory. And open the software check the license in the about tab.
	Lunch Time (12.30 AM - 01.30 PM)		
	Session 3	01.30 pm to 2.40 PM	**Schematic in Eagle CAD** i. Open the software and create the new project by right clicking the eagle folder under the project tab. ii. Name the project as our requirement iii. Now right click the created project folder, new schematic has to be select and save the schematic iv. Designed circuit has to be draw in that white area.
	Session 4	02.50 PM to 4.00 PM	**Board Layout** i. Change the grid value to 1mm and multiple 1 and ALT to 0.5mm ii. Draw the outline (or) move the outline to required size (measure the board size and draw the outline). iii. Place the parts according to the requirement and draw the trace according to connection iv. Finally draw the GND plane if need.

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Day	Session	Time	Topics to be Covered
Day 2	Session 5	09.00 AM to 10.40 AM	**Gerber Settings** i. Press CAM processor button ii. Device :PS_inverter(for trace); PS (for silkscreen) iii. Scale : 1(scale should always to be one) iv. Save the file in required location v. And process the job
	Session 6	10.50 am to 12.30 PM	**Printing and Film cutting** i. Convert the PS file (postscript) to pdf file (options are in Ghost view software) ii. Print the trace in A4 sheet check weather scale settings are equal which we given.(Measure the dimensions). iii. Now print the trace in OHP sheet using laser printer. • Trace (TOP or BOTTOM) - 2 copies • Silkscreen – 2 copies • Placement – 1 copy in A4 sheet iv. After taking 2 copies paste it together with the fevi-kiwik and leave it for dry. Do for silk screen copy (don't paste the gum inside the layout) v. Cut the film (Photoresist film) according to the board size.
	Lunch Time (12.30 AM - 01.30 PM)		
	Session 7	01.30 pm to 2.40 PM	**Board cleaning and UV Explosion** i. Clean the board with scrubber with the detergent wash it thoroughly. ii. Now paste the photoresist film which we cut before iii. Take cello tape paste it both side of the film and wipe out one side lamination cover of the film. iv. And paste it gently on the copper clad v. Now heat the board at 100*C with laminator (or) Iron box. In iron box rotate the temp nob to (**) double point which means(100*C). And gently wipe the board by placing the A4 sheet top and bottom. And kept for cooling. vi. Now place the OHP sheet which we prepared before on the top of the board. And kept it in UV light for 3-5min.

Day	Session	Time	To[illegible]s to be Covered
Day 2	Session 8	02.50 PM to 4.00 PM	**Developer treatment and Etching** i. After UV exposure remove the lamination cover on the board by using cello tap ii. Mix 1 gram of sodium carbonate (washing soda) in 1 liter of water. And place the board gently wipe with the brush. iii. After all photoresist film removed, wash the board with water gently iv. Now Etching process, etching solvent is placed in the tray and pour the water. If etching solvent is higher time for the etching copper is reduced. v. Now put the board inside the etching solution and shake it gently up to copper are etch.(For etching hot water is placed under the tray). vi. After all coppers are etched. Clean the board with running water. And also where gloves for safety.
Day 3	Session 9	09.00 AM to 10.40 AM	**Photoresist Remover** i. After cleaning the board, use 1 gram of sodium hydroxide and dissolve in the water. And put the board for 10 mins (or) up to photoresist removed. ii. Clean the board with water and wipe it with tissue paper.
	Session 10	10.50 am to 12.30 PM	**Green mask and drilling** i. Now put a drop (or) amount which needed and place OHP sheet above it and wipe it evenly with ATM card. ii. And place silkscreen OHP sheet which we prepared earlier over the OHP sheet placed the top of the board. And exposure to the board about 5 min. iii. Now remove the sheet gently. Use thinner to clean the board. So that excess paint will dissolve. iv. Now the board and use the 0.8 mm and 1mm bit put holes were needed.
	Lunch Time (12.30 AM - 01.30 PM)		
	Session 11	01.30 pm to 2.40 PM	**Soldering and testing** i. Solder the components and test the circuit. ii. Check the voltage at each point and compare with old data which already taken on first process.
	Session 12	02.50 PM to 4.00 PM	**Assessment Test & Certificate Distribution**

Coordinator

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(6)

Gmail

M Ramasamy <ramasamyksrce@gmail.com>

Proposal

Kumaresan Ccube <kumaresan@ccubetechnologies.com> Sun, Aug 4, 2019 at 10:28 AM
To: ramasamyksrce@gmail.com

Dear Sir

Greetings from C CUBE TECHNOLOGIES!

I am very delighted to draft this email bringing our curiosity to have a C CUBE relationship with your esteemed institution.C CUBE is an Solution provider with excellent track record and trust in the institutions.

Here with enclosed our training proposal .kindly download the attachment.

We are interested to be in touch with you for further discussion , Please let me know your convenient date and time by replying to this email.

We appreciate you to go through our website by clicking the following link: http://www.ccubetechnologies.com

Looking forward hearing from you

--
With Regards...

N. Kumaresan
BDM,
C Cube Technologies,
M: +91 98438 78009.
E.Mail: *kumaresan@ccubetechnologies.com*

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49 C, First Floor, Amman Complex,
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E. V. N Road, Erode –638011.TN, INDIA.
Ph: 0424 – 2255076, +91 9843520101.
www.ccubetechnologies.com

Proposal
For
On – Campus Training Program

100+ Courses, 20+ Accreditations

Submitted by:

C CUBE TECHNOLOGIES

CAD/CAM/CAE

Solution Provider

"Expand your mind, change your world"

Technology Partner

AUTODESK Authorized Training Center | Bentley Institute Product Training Partner | SketchUp Authorized Training | Tekla

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(8)

AUG 04, 2019

To

The Head of the Department
Electrical and Electronics Engineering,
KSR COLLEGE OF ENGINEERING
KSR Kalvi Nager
Thiruchengode

Dear Sir/Mam,

Greetings!!

C CUBE TECHNOLOGIES is a trusted Name in CAD/CAM/CAE & IT Education with 15+ years of Excellence.

C CUBE TECHNOLOGIES that provides services in Education, Development and Consultancy under single umbrella. As a trusted education partner we deliver more than 100 CAD & IT training courses such as **Mechanical CAD, Civil / Architectural CAD, Electrical & Electronics** for 20+ leading Vendors. We leverage these vendors professional technical training content and combine it with our award-winning course instructors to produce a consistently superior level.

Certified Education is our SOLE Business!

Your Training is our business. We focus on offering you the best class-room and on-campus TRAININGS, SEMINARS and WORKSHOPS along with the best PLACEMENT ASSISTANCE to ensure that you land at your dream job right after you get certified by C CUBE.

C CUBE instructors are among the best in this region, having received awards and recognition from our partners .When you take a certified training course with C CUBE you can rest assured that you are learning from qualified and enthusiastic professionals.

C CUBE upholds this high level of standards so that you can trust your IT training with us.

We look forward to your kind cooperation in our attempt and will wait for your reply.

Thanks & Regard

N.KUMARESAN

Business Development Manager

98438 78009

Technology Partner

AUTODESK Authorized Training Center | Bentley Institute Product Training Partner | SketchUp Authorized Training | Tekla

C CUBE @ CAMPUS

(To bridge the gap between education & employment)

Companies are looking for demonstrable Specialization, Aptitude and Skills when recruiting fresh Engineering graduates.

C CUBE @ Campus Why?

C CUBE through its Industry experts and network of partnership Industries is bringing a program to bridge the gap between Academic learning and Industry expectations, creating a win-win environment where the Engineers graduate with latest, specialized, industry oriented skills and the Industry gets fresh Engineers who can be productive with minimal orientation.

The key features of the Campus Program are

- Design Engineering Training with **Autodesk, PTC, Bentley, Ansys, Tekla** authorized training program
- Training on product design and development methodologies based on Industry practices
- Alignment of the trainings in line with design and manufacturing practices of the partnering industries

Benefits of Engagement of Adoption at Your Campus with C CUBE

- We will equip CAD labs of Civil, Mechanical & Electrical Engineering with latest version software and provide support to maintain the lab.
- **MOU** with **Autodesk, PTC, Bentley, Ansys, Intek Tekla** authorized training centre.
- Autodesk , PTC, Bentley, ANSYS , Tekla Certified trainer training.
- Use the Name of Autodesk, PTC, Bentley & ANSYS logo inside campus and college profile.
- By using our deep industrial experience, we provide you the Know-How to bridge the technology gap.
- Providing additional resources to aid classroom training, Project & course implementation
- Prepare the graduates better before entering the industry workforce through relevant

Technology Partner

AUTODESK Authorized Training Center | Bentley Institute Product Training Partner | SketchUp Authorized Training | Tekla

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(12)

ANAND T

PERSONAL DETAILS

Name	:	Anand T
Date of birth	:	15.12.1990
Address	:	2/17B, Vairam Street, Municipal colony, Erode – 638004.
Mobile	:	9790928992
E-mail	:	Richianand1990@gmail.com
LinkedIn	:	linkedin.com/in/anand-kumar-280522141

PROFILE

I'm an efficient Candidate, who has been consistently praised as hard-working by my co-worker and management. Highly flexible in adjusting work pace to meet evolving client needs. I am enthusiastic and I work with decisiveness. Overall, I have consistently demonstrated creative thinking and teamwork abilities.

SUMMARY OF SKILLS

- Good experience in **C, Python** programming.
- Good knowledge in designing **Hardware Circuits** and **PCB**.
- Proficient in **Arduino, Tina, Eagle CAD, Google Sketch Up.**
- Good Knowledge in **ARM Cortex M4, AVR, 8051, PIC.**
- Basic Knowledge in **Neural Network, Machine learning.**
- Good Knowledge in **Python Flask, Flask MQTT, Threads, Paho MQTT, Sockets, Matplotlib.**
- Proficient in **NetBeans, Android Studio.**
- Good Experience in **EEPROM, ADC, DAC, Interrupts, SPI, I2C** and **UART** serial interface.
- Developed admin panel with **HTML, CSS, JQuery, AJAX** and **MySQL** using **Flask**.

INTERESTS & EXTRA INFORMATION

13/10/16 – 15/10/16 **PCB Design Workshop**

Conducted workshop on PCB Board Making for 30 Students.

- Using Eagle CAD, PCB layouts were designed.
- With Photo-Resist Method, PCB-boards were made.

01/2017 – 03/2017 **Home Automation**

Converted my Home into smart home with my Mapping Technique

- Collect the data from the Nodes and Stores the data in server database.
- **AJAX** is used to get Synchronize data, which Node sends.
- Android application was created and the URL is called by **Asyn Task**
- Stand alone application was created with **Java FX** for the User Interface.

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WORK EXPERIENCE

01/2013 – 04/2015 **Electrical Supervisor**

Jaya Gowri Spinning Mills (p) Ltd, Maintenance in Electrical Department

- Measured Harmonics with the Hantek Current probe by using digital CRO.
- Maintained the Power Factor to 0.99 with SAPF correction device.
- Man power reduced by implementing Low Cost Automation for the machines.
- Power cost was reduced from Rs.8/Kg to Rs.6.25/Kg by introducing drives.

01/2018 – 06/2019 **Embedded Developer**

Casperon Technologies (p) Ltd, Chennai.

- **On Board Diagnostics(OBD): -**

  *Getting data's (speed, RPM, Engine load, Engine coolant, location) from car and send it to server via **MQTT** (python web server). Customer can view their car details via BLE*

  - Interfaced Car **ECU** via **CAN BUS** using STN2102
  - Quectel MC60 was interfaced via **UART** for **GSM**, **GNSS** and **BLE** 3.0
  - **Python** web server was created using **Flask** to store data in **MySQL** database.
  - 3D casing was designed using Google sketch up
  - Designed 4-layer PCB in **Eagle CAD** and Gerber was created for fabrication.
- **Honey Bee Comb: -**

  *Monitoring weight, Temperature (inside and outside), Humidity (inside and outside) of honey bee comb periodically and send it to server via **MQTT.***

  - **3D casing** was designed using Google sketch up.
  - **ARM Cortex** was used to interface Temperature and humidity sensor via **I2C**.
  - Transmitting and receiving the data from parent to child and child to parent was done by RF module.
  - Interfaced Alloy Load Cell with **ARM Cortex** via 24bit ADC (HX711).
  - Simple **Neural Network** was created for Health monitoring using Acoustic sound as inputs (converting Time Domain to Frequency Domain via **FFT**).
- **Water Level Monitoring: -**

  *Monitoring analog level of the water in the tank (Lower, Upper), Motor Voltage, current and power consumption were send to server via **MQTT**.*

  - Transmits and receives the data from Upper to Lower and Lower to Upper tanks, was done by RF Signal
  - **PT** and **CT** were used to measure Voltage, Current and power consumption.
  - **Two terminal transformer** was used to split ground of motor relay and control unit and also to eliminate the EMI.
  - **3D casing** and **PCB** design was done with google sketch up and Eagle CAD.
  - **Analog Measuring** device was developed to measure the tank water level

08/2019 – Present **Embedded Software Developer**

Innospace Automation service (p) Ltd.,

- Working in CRM project using Odoo.
- Sensed eight pulse at rate of 3Khz using Interrupt with ESP12
- Encrypted data was transferred from weighing scale to Android mobile.

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EDUCATION

2015 – 2017 **Master of Engineering**
KSR College of Engineering, Tiruchengode.
- Power Electronics and Drives.
- Graduate with **86%**.

2008 – 2012 **Bachelor of Engineering**
Hindustan University, Chennai.
- Electrical and Electronics Engineering
- Graduate with **59.9%**.

2005 – 2008 **Schooling**
Vedhha Vikass Higher Secondary School, Salem.
- State board
- Graduate with **77.8%** in 12th and **71.2%** in 10th

ACADEMIC PROJECT

01/2013 – 04/2015 **Uninterrupted power supply using Arduino with remote control**
Developed a remote control system to operate the UPS remotely
- Fans lights were controlled remotely which is connected to the UPS.
- Designed Inverter with unipolar PWM switching.

07/2016 – 05/2017 **Automated Node Network Interface using CoAP with NRF24l01**
Converted Home into smart home using CoAP
- Nodes were connected automatically through Wireless Transceiver.
- User can easily access his/her home using Mobile/Laptop/Tablet via CoAP.

COURSE COMPLETED

02/07/12 – 19/08/12 **PCB Design Couse**
Successfully completed PCB Design Course in Sienna ECAD, Bangalore.
- Cadence Allegro was used to design the PCB Layout.
- Designed up to 4 layers Layout Board.
- Components were created in the library for different Packages.

01/03/13 – 30/03/13 **AutoCAD 2D**
Successfully completed AutoCAD Course in CADD center, Dharmapuri.
- Designed BLDC motor using Reverse Engineering Technique.
- Designed Electrical Panel Board for Textile Industry.

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ANAND T

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R. SRINIVASAN B.B.M.,
Chairman cum Managing Trustee

Dr. P. SENTHIL KUMAR M.E., Ph.D.,(IITM)
Principal

Date: 15.02.2020

To

Anand T

Innospace Automation Services Private Limited,

Chennai – 600083.

Respected Sir,

Sub.: Letter of Appreciation – Reg.,

We glad to thank you very much for delivering an informative and thought providing lecture in the Value Added Course Titled "Design of Printed Circuit Boards (PCB) using Photo Resist Method" jointly organised by the department of Electrical and Electronics Engineering and Innospace Automation Service Limited conducted during 13.02.2020 to 15.02.2020. We are looking forward for your cooperation for the promotion of professional education in future as well.

Thank You

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Department of Electrical and Electronics Engineering

VALUE ADDED COURSE ON **"Design of PCB using Photo Resist Method"**

LIST OF STUDENTS REGISTERED FOR THE COURSE

Duration : 13.02.2020 to 15.02.2020

S.NO	REG.NO	NAME OF THE STUDENT	YEAR/SEM	STUDENT SIGN
1	1714001	ABINASH .S	III /VI	
2	1714007	BHARATHI KATHIRAVAN.B	III /VI	
3	1714012	DHINA.M	III /VI	
4	1714029	HARISHWAR.R	III /VI	
5	1714036	JOTHIKA.A	III /VI	
6	1714037	KARTHIKEYAN.P	III /VI	
7	1714502	ELAMBARUTHI.R	III /VI	
8	1814001	AKASH.K	II/IV	
9	1814003	DEEPANRAJ.M	II/IV	
10	1814005	DINESH RAJAN.R	II/IV	
11	1814007	HARIKRISHNAN.M	II/IV	
12	1814008	JAYAPAL.R	II/IV	
13	1814009	KARANSANTH.E	II/IV	
14	1814013	SABAREESHWARAN.M	II/IV	
15	1814015	SIVARAMAN.A	II/IV	
16	1814016	SRIDHAR.M	II/IV	
17	1814501	AJITH.N	II/IV	
18	1814503	ARUNRAJ	II/IV	
19	1814504	BHARATHKUMAR.E	II/IV	
20	1814506	ELAMATHI.S	II/IV	
21	1814507	ELANGO.M	II/IV	
22	1814508	ELILARASU S	II/IV	
23	1814510	GUNASEELAN.S	II/IV	
24	1814511	JAGADEESHWARAN P	II/IV	
25	1814516	MANIVEL M	II/IV	
26	1814517	MONISHWARAN.S	II/IV	
27	1814518	NARAYANAN M	II/IV	
28	1814519	NAVEEN.K	II/IV	
29	1814520	NAVEENKUMAR.M	II/IV	
30	1814521	NIRMALNATHAN.B	II/IV	
31	1814525	RANJITH.P	II/IV	
32	1814530	SHARMILA.J	II/IV	
33	1814534	VELMURUGAN.M	II/IV	
34	1814535	VIGNESH.E	II/IV	
35	1814537	VIVEKA.S	II/IV	
		TOTAL NUMBER OF CANDIDATES	**35**	

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12/02/2020

Coordinator

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HOD/EEE

KSRCE/QM/7.2.1/19/EEE

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VALUE ADDED COURSE (VAC)

ON

"Design of Printed Circuit Boards Using Photo Resist Method"

13th February 2020 – 15th February 2020

FEEDBACK FORM

1.	How useful did you think this event was for you?		
	a) Excellent ✓	b) Good	c) poor
2.	Are you satisfied with our guidance and support?		
	a) Excellent ✓	b) Good	c) poor
3.	Did the speaker do an effective job of presenting the material?		
	a) Excellent ✓	b) Good	c) poor
4.	How much you are satisfied with the materials provided?		
	a) Excellent ✓	b) Good	c) poor
5.	The seminar material is of sufficient depth/breadth to impart new information to me.		
	a) Excellent ✓	b) Good	c) poor
6.	How much you are satisfied with our overall programme?		
	a) Excellent ✓	b) Good	c) poor
7.	The course was of practical value for me.		
	a) Excellent ✓	b) Good	c) poor
8.	What could be improved?		

* Arrange some facility for practical classes. Insufficient space and Time.

Weightage: Excellent – 3, Good – 2, Poor – 1

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Namakkal Dist., Tamilnadu

S. Vinoth
Signature

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

VALUE ADDED COURSE (VAC)

ON

"Design of Printed Circuit Boards Using Photo Resist Method"

13th February 2020 – 15th February 2020

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	a) Excellent ✓	b) Good	c) poor
5.	The seminar material is of sufficient depth/breadth to impart new information to me.		
	a) Excellent ✓	b) Good	c) poor
6.	How much you are satisfied with our overall programme?		
	a) Excellent	b) Good ✓	c) poor
7.	The course was of practical value for me.		
	a) Excellent ✓	b) Good	c) poor
8.	What could be improved?		
	very good improvement.		

Weightage: Excellent – 3, Good – 2, Poor – 1

PRINCIPAL Signature

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Value Added Course (VAC) on Design of PCB using Photo Resist Method

13th February 2020 - 15th February 2020

PHOTOGRAPHS OF THE PROGRAMME

Snapshot 1

Snapshot 2

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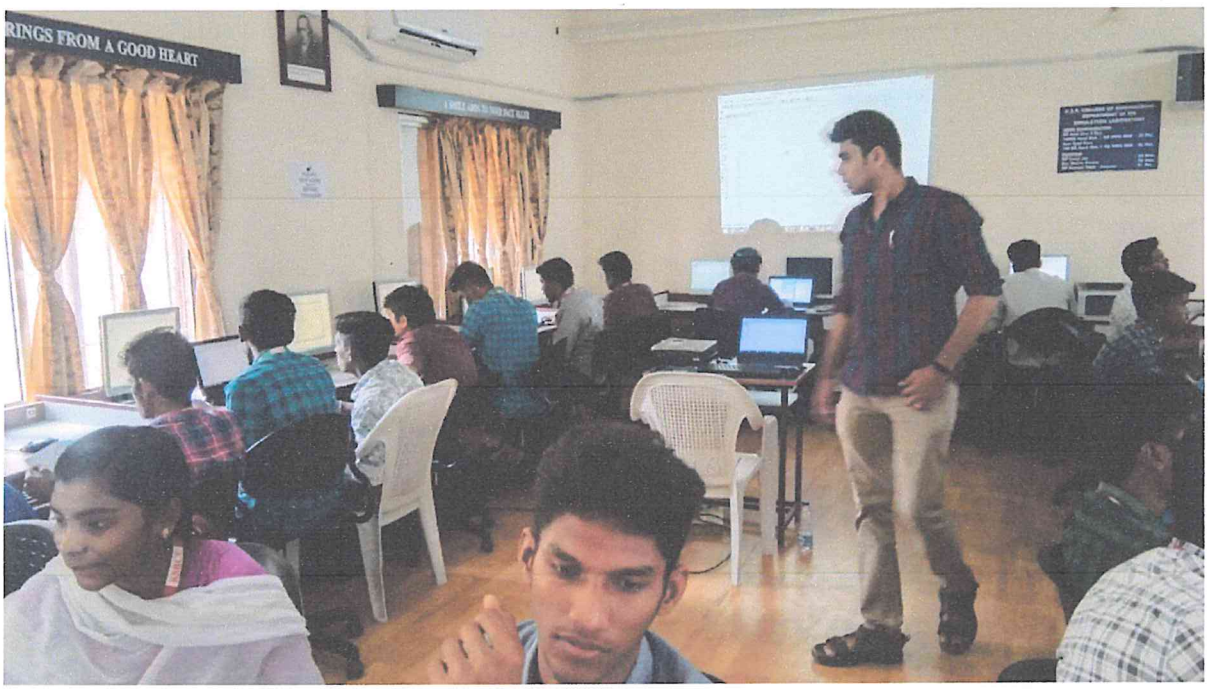

Snapshot 3

Snapshot 4

K.S.R. COLLEGE OF ENGINEERING TIRUCHENGODE 637 215

PRINCIPAL
K.S.R.COLLEGE OF ENGINEERING
K.S.R.Kalvi Nagar, Tiruchengode-637 215
Namakkal Dist., Tamilnadu

Snapshot 5

Snapshot 6

K.S.R. COLLEGE OF ENGINEERING TIRUCHENGODE 637 215

PRINCIPAL
K.S.R.COLLEGE OF ENGINEERING
K.S.R.Kalvi Nagar, Tiruchengode-637 215
Namakkal Dist., Tamilnadu