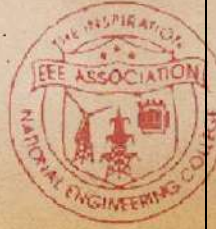# NATIONAL ENGINEERING COLLEGE

(AN AUTONOMOUS INSTITUTION)
K.R.NAGAR, KOVILPATTI-628503.

EEE NEWSLETTER

AUGUST 2019

Volume 7 Issue 3

CONTENTS

STAFF ACTIVITIES

STAFF ACTIVITIES

S.No.	Name of the Staff	CAMP	Date	Place
1.	Dr.N.B.Prakash, Associate Professor/EEE	CATC cum DTE TRG TRG-II Camp	23.08.2019 to 01.09.2019	NTA, Idayapatti

INDUSTRY - INSTITUTION INTERACTION MEMORANDUM OF UNDERSTANDING

Signed a Memorandum of Understanding (MoU) with M/S Bharu Technologies Pvt Ltd, Chennai for 3 years periods.

BENEFITS OF MoU:

- UG and PG Students, who are interested in the field of manufacturing analog card, 16 channel relay card & 8 channel relay card, will be selected by interview, for the Internship programme every year.

- These selected students will be deputed to Bharu Technologies during summer vacation for two weeks.

- Students will be allotted Internal Guide(s) to monitor the progress of the projects.

- Faculty members of the EEE Dept. will be deputed to Bharu Technologies every year for knowledge updation during summer vacation for a maximum period of two weeks.

DEPARTMENT ACTIVITIES

SPECIAL INTEREST GROUP

POWER ELECTRONICS & DRIVES

A seminar on "**Renewable Energy System**" was conducted on 29.06.2019by *Mr. Sankar N, Assistant Professor /EEE* at Class Room H4 for Special Interest Group (SIG) members.

The objectives of the session were:

- To discuss the different types of Energy Sources and Need for Renewable Energy Sources.
- To discuss the basics of Solar PV and Wind Energy System
- To discuss the challenges/Research areas in Solar PV System

The Session started with the brainstorming about the different types of Energy Sources and Environmental Impact of Conventional Energy Sources other than Hydro Energy. Then the need for Renewable Energy Sources and different type of Renewable sources were discussed. With the overview of History of Solar Photovoltaic, discussed about the Solar Cell, Open Circuit Voltage, Short Circuit Current, Maximum Power calculation, Types of Solar PV and Standalone applications of Solar PV. Further discussed about the challenges in the Solar PV Integration with Power Grid. At the end of the session, give some glimpses about the components of a Wind Mill and its functions. The session was ended with how to select an area for installing a Wind Mill.

The session was started by 11.20 AM and completed by 12.40PM. Totally 8students from third year were participated.

HIGH VOLTAGE ENGINEERING

EEE department- High Voltage Engineering SIG group conducted a technical seminar on the topic **"Latest insulating fluids used in transformers"** by **Mr. P. Samuel Pakianathan, AP/EEE** on 29.06.2019 in EEE department for final year and third year students. In this session he explained about the basic construction and working of transformers. And he explained about various insulating schemes used in the transformers. Also he explained about the latest liquid insulating materials used in the transformers and various anti oxidant materials. The outcome of this session includes finding the alternate fluids for better performance of the operation of the transformer. The students are motivated towards the enhancement of the performance of the transformer oil by conducting various experiments in the high voltage laboratory.

CONTROL AND INSTRUMENTATION

Department Control and Instrumentation Special Interest Group (SIG) conducted a technical seminar on the topic **"Tuning of PID Controller using Zeigler Nichols Technique"** on 29th June 2019 in the EEE department, Control and Instrumentation Laboratory. The resource person for the program was *Ms.E.Anitha AP/EEE.*

She gave a brief introduction about PID controller and it's effects. She explained about the Zeigler Nichols technique. Students were given the transfer function of BLDC Motor. They found the stability of the system by Routh Hurwitz stability criteria.

The students calculated the Kp, Ki and Kd values for the PID Controller using Zeigler Nichols technique and designed the PID Controller.

They were taught to employ the transfer function of motor driver to gain knowledge about the response of the system. MATLAB software was provided for the students to simulate the system.

7 number of prefinal year students of EEE attended the seminar for updating the knowledge in PID Controller Tuning. The technical seminar was concluded with the discussion of students and the resource person.

POWER AND ENERGY

A technical session on "Power system-Introduction & Importance" was conducted by *Ms. S.Sheebanancythangam, AP/EEE* on 29.06.2019 at EEE Hall No.H6 for special Interest group members.

The following topics were elaborated to our SIG in the session,

- Introduction to power system and it's importance
- Concepts of real and reactive power, power factor
- Power balance and frequency regulation
- Battery energy storage system and electric vehicle

The session was conducted for third year students. The session was started by 11.30 and completed by 12.30 PM. Totally 33 students were participated and got knowledge about need of power system.

POWER ELECTRONICS & DRIVES

A technical session on "**Application of power Electronics components**" was conducted by *Ms.M.Madhuri Chithra, AP/EEE* on 06.07.2019 at EEE Hall No.H4 for special Interest group members.

The following topics were elaborated to our SIG in the session,

- ✓ Introduction to power Electronics components.
- ✓ Importance of Switches.

- ✓ Working of MOSFET, IGBT, SCR, TRIAC.
- ✓ Application of Power Electronics Components.

The session was conducted for third year students. The session was started by 11.30 and completed by 12.30 PM. Totally 12 students were participated and got knowledge about Basics of power Electronics components and its applications.

HIGH VOLTAGE ENGINEERING

A technical session on "**Breakdown in solid Dielectrics**" was conducted by *Mrs.Avudaiammal, AP/EEE* on 06.07.2019 at EEE Hall No.H5 for special Interest group members.

The following topics were elaborated to our SIG in the session,

- ✓ Introduction to high voltage
- ✓ Importance of high voltage insulation
- ✓ Introduction about dielectrics
- ✓ Various breakdown in solid dielectrics

The session was conducted for third year students. The session was started by 11.30 and completed by 12.30 PM. Totally 4 students were participated and got knowledge about need of high voltage insulation.

ARTICLE BY ALUMNI

STRATEGY TO GET A GOOD RANK IN GATE

- **MR. SIVA SHANKAR. S. S**
BATCH: 2018
GATE SCORE OF 73.67 OUT OF 100. ALL INDIA RANK OF 1855 OUT OF 112097.
PG SCHOLAR, INDIAN INSTITUTE OF TECHNOLOGY, KHARAGPUR

Dear Students,

This article is regarding the preparation of Gate Exam. The word "Strategy" is used here because there are no Tips and Tricks in this exam, it is all due to your hard work and strategical learning of the subjects. Those students who study the semester exam by skipping all the questions in a unit and study a particular question to get a good mark, for them GATE is level playing here you have to do the same but with more in depth understanding of concepts. You never needed to learn the whole Engineering Syllabus for this exam.

The second thing is in the heading is the Good Rank. What does it mean??
Mere clearing the Gate will change nothing in your life. This GATE exam can be cleared If you study only MATHS and APPS itself. Nothing more required.

Now for the people who want to get good a rank. Here I am giving you the procedure to prepare it.

1. Firstly, see the syllabus of your branch and make a list of all subjects.
2. Start studying each subject. Allocate specific days for each subject and make sure you complete within time. Try to complete it by One to Two weeks for one subject.
3. Clear your basics and study all concepts. Note down Formulae on separate page and read them. By read I mean read them don't read to memorize them.
4. Give daily 1–2 hours for Maths (It is the dark horse of the EXAM, many prepare core subjects leave this part.) also. Maths is also important and can help you score 15 marks. With the score Maths an Apps you should be able to clear the exam, additional marks is to improve your score and rank only.
5. Solve Questions on each topic and when you finished a subject Revise it and give it's Test.
6. Practice as many Questions as you can. Revise each and every subject you have finished studying.
7. After Each subject solve it's Previous Year Gate Questions. It will help you to get idea of Gate questions.
8. Last 1–2 months dedicate for only Revision and Full-length Mock Tests. Solve as many Full Mocks as you can. You can register it on Gate coaching specific website.

9. Most Important don't get depressed if you scoreless in Mocks or don't be Overconfident if you score high marks in Mocks. As marks in Mocks doesn't define your Final performance in Gate.
10. It's ok to make mistakes in Mocks but make sure you don't repeat it in Final Exam. Note down where you went wrong in Mocks so you don't repeat in Final Exam.
11. Analyze your mock papers and study that concept where you went wrong.
12. Also Practice Aptitude and English. It can help you score 15 marks easily.

To Know whether you are prepared to take Gate:
1. You would be able solve the question paper within 2:15 to 2:30(hours).30 minutes should be a buffer in case the Qpaper made tough.
2. Most of the practice question you would be able to do without pen and paper, sometimes without calculator.
3. Not even a single topic in GATE should not unprepared.

The Exam Pattern:
1. The Exam is 3:00 Hours. Online Exam
2. It contains 65 questions
3. It contains 15 marks from Aptitude. (the level of college placement level question will do.)
4. 14-18 mark (varies in this range) will come from MATHS which is more easy comparable to core subjects.
5. With increase competition GATE introduced numerical type questions. Which Is actually which decides the rank.(This type of questions found mostly after GATE 2011)

Till now you have completed the half battle, rest is on exam day.
What to do in exam:
1. They make you sit in front of your computer 45 to 30 min before exam. Login your computer and sit calm.
2. See your surroundings, adjust to it. But once exam starts don't see anywhere. Your full focus should be on Monitor
3. Once the exam starts, try to complete easy questions which will boost the confidence, mostly from maths and apps and some from core also.
4. Here comes the bigger battle between minds of you and the gate examiner (who sets q paper). Never ever think Examiner will give easy questions.
5. Examiner know how a student think. So, you should know how a Examiner thinks.
6. In most MCQ even if your answer is WRONG it will be in one of the OPTIONS you will happily mark the option and get a gift of NEGATIVE marking.
7. If you ever feel you got the correct answer without any effort try reverse engineer it and find whether other options matches with question. Mostly matches and you have to choose the best and logical answer out of the given options.(This type of question will ATTRACT you to mark the wrong answer.)

8. For Numerical you don't have the liberty to check the option. But it has NO NEGATIVE if you got wrong. This questions are the Rank Deciders between a TOPPER and the others. Who gets the more question correct will undisputedly be the topper.

9. It is IMPORTANT, If you prepared well and you feel the paper tough then all will have the same paper only. So need not worry attend the maximum question you know attend without getting wrong.

10. Complete the exam and check whether you missed any questions and any question you need to review.

For those who Don't Understand the above procedure for them I will explain in different context. Anyhow everyone knows the sport of Cricket. Hereby default Candidate is Batting team and the Examiner is the Fielding team.

It is T20 Final match (*GATE is conducted once in a Year*). You have been invited to bat in the pitch (sitting in the Exam computer). When the match starts (*Exam starts*). The fielding team uses the expert bowler (*sometimes q paper starts with a higher level of core subjects*). You have to see the field setting (*open the question paper as a whole*) and play according to the field gaps and score the runs (*find the easy questions and solve those*). You get starting powerplay which you use to score maximum (*get max mark from apps and maths in first 30 mins, this time you should feel I crossed the qualifying mark and every mark improves my rank*). If you didn't play well, lost wickets the score would be low (*you feel I am not confident with answers, and some answers might be wrong*) then you will not at par total.

If you did well then it will automatically boost the total (*with the increase in self-confidence you can do some difficult questions also*). Every boundary will make your task easier (*solving Numerical type questions*). More important don't leave the free hit ball (all Maths questions). Because every runs matters (*Every mark matters*). Sometimes bowler bowls a juicy full toss ball thought of hitting over the boundary but caught at the rope. (the *questions which are made as a trap by the examiner, check all the options before moving on*).

If the pitch is green and bouncy (*Question paper is tough for all of them*) then all the ball will be bounce and swing, batsman can't attend (*leave those questions*). Attend the ball which you can drive through the covers perfectly, (*questions which you can attend confidently*)

The net sessions and the practise you made before the match will make an impact (*Solving the Mock practice test*). Watching the videos of the opponent team bowling attack before the match. (*Solving the previous year question paper*)

This is how a T20 match is played…

There is a TEST match also (UPSC ESE- Engineering Service Exam)
Thank your patience of reading this article, Don't worry I don't take TEST match now .
All the best for all the students for their future endeavors.

PLACEMENT DETAILS

On behalf of the Chairman, Managing Director, Director, Principal, Head of the Department and staff members, we heartily congratulates the final year students who got placed in the Campus drive in our campus during the month of August 2019

M/s. CADENCE DESIGN SYSTEMS, BANGALORE

Ms. VAVUNIYA.M

M/s. SOLARTIS, MADURAI

Ms. MAHALASKHMI. T

STUDENTS EXPERIENCE IN INTERVIEW

- Ms.Maha Lakshmi.T,
Trainee, Solaritis Madurai

Round 1: Online Test

The first round in the selection process was online examination. It consists of 45 questions with multiple choices. There was negative marking for the incorrect answers. Aptitude was quite easy , that made me to clear the first round. There will be sectional time to finish the particular section. Each section should be completed within 15 minutes.

- **Question Pattern**
  - Aptitude (15 questions)
  - JAVA MCQ (15 questions)
  - SQL queries (15 questions)

Round 2: Coding Test

The coding test is conducted in the online hackerearth platform. There will be no negative marking in this round. There will be no sectional time. JAVA programs were simple and we had to compile and run the program to fetch the output. SQL queries were from joins, create, drop, backup functions. We have to submit the output for both JAVA programs and SQL queries.

- **Question Pattern**
  - JAVA program (4 questions-each carry 100 marks)
  - SQL queries(3 questions- each carry 50 marks)

Round 3: Group Discussion

This round may be either group discussion or just a minute talk. For me it was just a minute talk round. They will give hundred topics, from which we have to choose one. I had chosen the topic "Should Group Discussion be a part of Campus Interview?" .I started this round with the small self introduction and I approached this topic in a positive manner.

Your answers must be audible; it shows your confidence level. You must be honest. There are three kinds of paper given to me which consists of

- Business topics
- Management topics
- Indian economy topics

Round 4: Technical HR

This round started with self introduction and I was asked to tell why I am migrating from EEE to IT Company. Then I was asked to explain my academic mini projects and paper presentation topics that I had attended in the previous semesters. I was supposed to explain the concepts of inheritance, polymorphism in OOPS then they asked me to explain about the trending topics in my area of interest (EEE).

I explained about smart grid and it necessity with real time examples. As time rolled on, they asked me whether I have any questions for them, why are you coming for Solartis. Being confident, while explaining the answers made me clear this round.

Round 5 : General HR

This round was started with self introduction and they asked me whether I know any person working in Solartis, I told about one of the senior of EEE department who got placed in Solartis the previous year. They asked me whether I can relocate from Tirunelveli to Madurai. Do you have passport and will you be able to work in shifts in abroad. Then salary package discussion. This round came to an end with the question of Do I have any questions for them. Being expressive and maintaining good eye contact with positive energy and confidence level made me to clear this round.

- *Ms.Vavuniya.M,*
Cadence Design Systems, Bangalore

ROUND 1:

This round consists of 20 questions. In this, 15 questions are technical and 5 questions are aptitude which is based on logical reasoning. Technical questions only consist of circuit theory, operational amplifier, digital logic circuits and voltage regulator. The time duration is 1hour 30 minutes.

ROUND 2:

It is also a written test which consists of 5 technical questions. The time duration of the test is 1hour. The questions are based on circuit theory and digital logic circuits. Questions are mostly from the GATE questions.

ROUND 3:

It is a technical face to face interview. They asked some basic diode concepts and ask me to draw the circuit for producing a wave with charging time of t and discharging time of 2t. And they asked me to solve the question which I had answered wrongly.

ROUND 4:

It is a technical face to face interview. In this round also they asked me to solve the same questions asked in written test and some resistance, inductance, capacitance based questions.

ROUND 5:

In this round they asked me to solve the aptitude questions which are asked in first round. They asked some digital logic circuit based questions. And they asked about my family.

ONLINE MATLAB COURSE

MATLAB AND SIMULINK TRAINING

Our College has Campus License for MATLAB which can be useful for assessing the MATLAB in any PC/LAPTOP/MOBILE with college mail ID for all faculties and students. Also MathWorks offers self paced free training courses with MATLAB certification.

The following courses are offered by MathWorks:

- ✓ **MATLAB Onramp** – Get started quickly with the basics of MATLAB
- ✓ **Simulink Onramp** - Get started quickly with the basics of Simulink.
- ✓ **Deep Learning Onramp** - Get started quickly using deep learning methods to perform image recognition
- ✓ **MATLAB Fundamentals** - Learn core MATLAB functionality for data analysis, modeling, and programming
- ✓ **MATLAB for Data Processing and Visualization** -Create custom visualizations and automate your data analysis tasks
- ✓ **MATLAB Programming Techniques** - Improve the robustness, flexibility, and efficiency of your MATLAB code
- ✓ **MATLAB for Financial Applications** - Learn MATLAB for financial data analysis and modeling
- ✓ **Machine Learning with MATLAB** - Explore data and build predictive models
- ✓ **Deep Learning with MATLAB** - Learn the theory and practice of building deep neural networks with real-life image and sequence data
- ✓ **Introduction to Symbolic Math with MATLAB** - Get started quickly with an introduction to symbolic math
- ✓ **Solving Nonlinear Equations with MATLAB** - Use root finding methods to solve nonlinear equations
- ✓ **Solving Ordinary Differential Equations with MATLAB** - Use MATLAB ODE solvers to numerically solve ordinary differential equations
- ✓ **Introduction to Linear Algebra with MATLAB** - Use matrix methods to solve systems of linear equations and perform eigen value decomposition
- ✓ **Introduction to Statistical Methods with MATLAB** - Get started quickly with basic descriptive statistics and data fitting

These courses are useful to develop MATLAB programming language knowledge along with MATLAB Certificate which will helpful during placement.

Our department students are instructed to utilize the facility by doing the above said self paced courses.

Guidelines for Registering Courses:

1. **Login to MathWorks:**
   a. Click the **NEC-MATLAB Portal** in our College Website
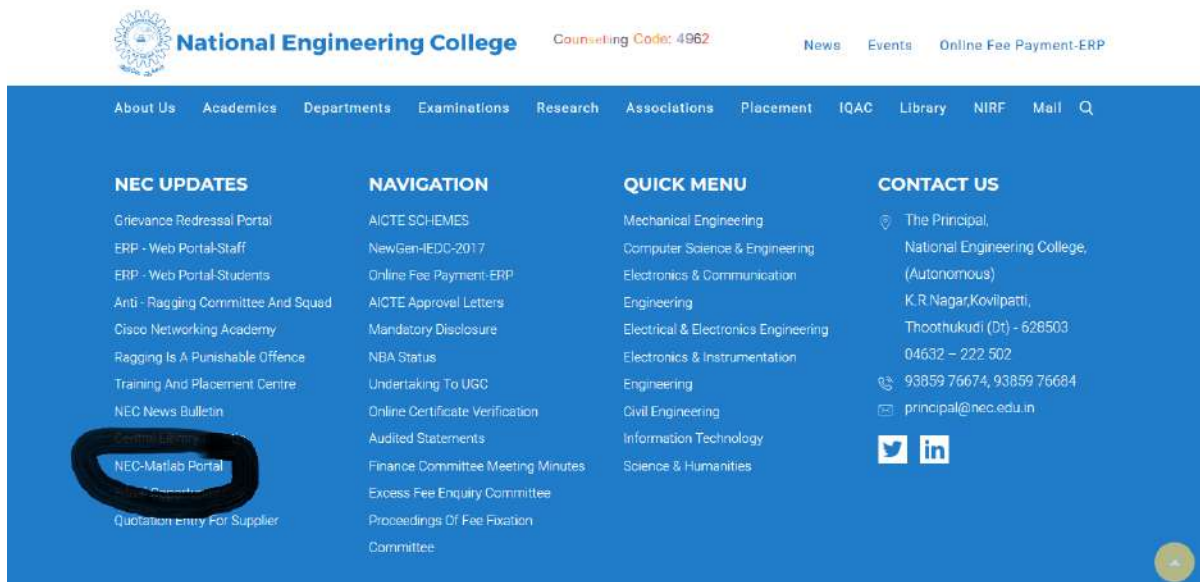
   b. This will navigate to **MathWorks** website for **Login**.
   c. If Registered users, they can directly login with their username (NEC mail ID) and password. Otherwise, they have to register for assessing the portal.

   Link:
   https://in.mathworks.com/login?form_type=tah_portal&uri=https%3A%2F%2Fin.mathworks.com%2Flicensecenter%2Ftotal_headcount%2F14631-65758-22941-91531-63823%3Fs_tid%3Dtah_po_start_nec

2. After login, click the link for directly go to training web page.
   Link: https://matlabacademy.mathworks.com/?s_tid=gn_mlac_cosp

3. By clicking Launch Button, registration for course is completed.

SOCIAL AWARENESS CELL

As a part of Social Awareness cell of EEE department an awareness camp was conducted for village peoples, *Pandavarmangalam,* on **30.08.2019** in the topic "Electricity usage, conservation and safety". The program was started with welcome address given by final year students. Followed by that the session was started by *Mr.K.Kumar, AP/EEE* with the comparison of renewable and non renewable energy sources and method of thermal power generation. Then he explains the Advantages and disadvantages of thermal power plant like,

Advantages:

- Fuel cost of thermal power plant is relatively low.
- We can produce thermal energy almost everywhere in the world.
- Heat production System is simple compared to other system.
- Overall system cost effective.
- Easy mechanism.

Following the session final year students explained the need of renewable energy sources and safety aspects to handle electricity. Final year and third year students play drama related to electricity conservation and safety. Also they put video demonstration to deliver the content to the people. Under the guidance of *Dr.S.Shanmugavel, Director, Dr.K.Kalidasa Murugavel, Principal, Dr.M.Willjuice Iruthayarajan, HOD/EEE and Dr.M.Ravindran, Asso. Prof(SG)/EEE, the session was coordinated by Mr.K.Kumar, Asst prof/EEE, Mr.Subburaj,* technician along with lateral entry students. Around 50 members attend the program and got benefited.

ALUMNI INTERACTION

Mr.I.RameshMoorthy (2019 passed out), now working in "*Data Patterns*" at Chennai. He was interact with final year students on 13.08.2019.

He gives the information about Board Design and Development PCB Design Services, FPGA Services Product Development Services.

He explains about Data Patterns is not only for designs and develops a wide range of building blocks, but also integrates total solutions for avionics and other rugged military hardware. The products are accompanied by test systems that validate the Line Replaceable Units, in order to ensure long term maintainability of the products.

He advised the students to be skilled in their core subjects. Then he shared his own college experience and how he got this job.

Mr.M.Srinivasan (**2019 passed out**), now working in a role of PCB design Engineer in "*Data Patterns*" at Chennai, came to our college on 13.08.2019. He attended an interaction session with final year students.

He explained about his company i.e Data pattern is the list of top service providers of Electronic Products & Components, Electrical Testing & Measuring Equipment in India. It is listed in Trade India's list of verified companies offering wide array of Instrument Test Unit ATE, VPX Based Quad 8640D Signal Processing Units, FPGA Mezzanine Card (FMC) etc. Contact here for Electronic Products & Components, Electrical Testing & Measuring Equipment in Chennai, Tamil Nadu.

He gives the information of their major customers. He advised the students to be utilized their time in the core subjects.

Mr.Karan (2019 passed out), now working in "Shree Abirami Engineering Works" at Chennai, which is one of the major companies in the field of Transformer manufacturing and repairing upto 500MVA 400kV class. He attended an interaction session with final year students on 13.08.2019.

He explained about his working nature in his company.

In that company, there are two transformer manufacturing and repairing plants located at Chennai and he explained about it. Apart from this, they also working in Transformer Rental/Hiring Division, Field Testing Division, NABL Accredited Transformer Oil Testing, NABL Accredited Transformer High Voltage Testing Lab and gives some valuable ideas about this.

He gives the information of their major customers. They are TANGEDCO,TANTRANSCO, BHEL, PGCIL, NTPC, SAIL, NLC, etc..,

He advised the students to be skilled in their core subjects. Then he shared his own college experience and how he got this job.

MOCK INTERVIEW

Department Placement forum organizes a Mock Interview for IV Year Students who have short listed in Data Patterns first round. The ultimate aim of the interview is too bring out the students from fear while facing interviews. The interview was scheduled on 31.08.2019. Totally 3 batches with 3 staff members are in the group. After Completion the students came to an idea of Do's and Don'ts in interview and they identified their current status of technical knowledge.

TIME TO KNOW OUR ALUMNI

GOMATHY SELVI. S

Batch: 1994 - 1998
Assistant Engineer,
Operation and Maintenance,
TANGEDCO,
Siruvachur,
Salem District,

EDUCATION DETAILS:

1994 – 1998	B.E. , National Engineering College, Kovilpatti
2005 - 2007	M.E., Kumaraguru College of Technology, Coimbatore

WORKING EXPERIENCE:

1999 -2002	Trainee in Dulex Computer centre, Ambai
2003 -2005	Lecturer at Muthayammal Engineering College, Rasipuram
2008 - present	AE, TNEB

ACHIEVEMENT:

Made arrangement for power supply to a village (Thiruvatthur, Sethur)

INDUSTRIAL VISIT

On 13th & 14th August 2019, 104 students and 4 faculty members from Electrical and Electronics Engineering discipline went for an industrial visit to Bangalore.

INDUSTRIAL VISIT DETAILS:

Our journey started from the college campus at 7.30 pm on 12th August 2019, we reached Bangalore by 7.00 am –August 13, 2019 and after refreshment we visited **Industrial Engineering Instruments [IEICOS], Peenya Industrial Area, Bangalore.** They are expertise in the field of testing, measuring instrument calibration, automation and control. A team of experts from IEICOS explained us about the various types of sensors, transducers, digital indicators and also discussed about their research projects in the defence sectors. Students clarified their doubts by interaction with experts. The visit ended by 2.00 pm.

On the second day August 14th, we visited **JVS Electronics Company Pvt. Ltd, Bidadi, Bangalore.** They are involved in the manufacture of protective and auxiliary relays and control equipment. They explained about the various types of relays earth fault relay, definite time over voltage relay, restricted earth fault relay, digital time delay relay etc. and about the test terminal block. On the whole, we gained a detailed knowledge about relays.

OUTCOMES:

Two days of industrial visit enriched technical knowledge of students. Besides technical enlightenment each and every one of us gained a lot of experience.

STUDENT ARTICLES

A MINIATURE STRETCHABLE PUMP FOR THE NEXT GENERATION OF SOFT ROBOTS

- *Ms. H.Selvadevi, Third Year EEE*

Soft robots have a distinct advantage over their rigid forebears: they can adapt to complex environments, handle fragile objects and interact safely with humans. Made from silicone, rubber or other stretchable polymers, they are ideal for use in rehabilitation exoskeletons and robotic clothing. Soft bio-inspired robots could one day be deployed to explore remote or dangerous environments.

Most soft robots are actuated by rigid, noisy pumps that push fluids into the machines' moving parts. Because they are connected to these bulky pumps by tubes, these robots have limited autonomy and are cumbersome to wear at best.

Soft pumps can also be used to circulate liquids in thin flexible tubes embedded in smart clothing, leading to garments that can actively cool or heat different regions of the body.

How does it work?

The soft and stretchable pump is based on the physical mechanism used today to circulate the cooling liquid in systems like supercomputers. The pump has a tube-shaped channel, 1 mm in diameter, inside of which rows of electrodes are printed. The pump is filled with a dielectric liquid. When a voltage is applied, electrons jump from the electrodes to the liquid, giving some of the molecules an electrical charge.

These molecules are subsequently attracted to other electrodes, pulling along the rest of the fluid through the tube with them. We can speed up the flow by adjusting the electric field, yet it remains completely silent.

RECENT INVENTIONS IN THE ELECTRICAL ENGINEERING

- *Ms. M. Nivedha, Final Year EEE*

Smart Electrical Grid:

America's electrical grid has been heralded as one of the greatest engineering achievements of the 20th century, enabling customers hundreds of miles away from power plants to be instantaneously supplied with power. However, the technology that underpins it is aging and rapidly becoming inadequate to deal with the increasing demand for electricity and the rapid modernization of our society. During the early days of the electrical age, electricity was provided from power plants via a plethora of local grids. These power plants were generally located both close to customers and to their fuel sources. Power was delivered to customers over short distances and at low voltages. Although this system worked well enough initially, it was not scalable as more and more people began to clamor for electrical power. As a result, these smaller grids grew, and a more complex system, involving steps up and down in voltage to facilitate transmission, was created

What are the problems with our current system?

The current electrical grid has little to no capacity for electricity storage, so any power that is generated must be instantly consumed. If supply does not match demand, the frequency of the AC voltage can change. If it falls outside of a certain range, it can cause the failure of electrical equipment or even parts of the grid itself. The electrical grid is based on a supply-follows-demand system, meaning that consumers essentially determine how much electricity will be used, and the suppliers need to adjust their outputs to match it accordingly. Economic incentives, like electricity rates, are usually only effective on a month-by-month basis, and thus have little effect in controlling short-term fluctuations in demand. It therefore falls to the power plants to vary their output to keep pace exactly with demand increases and shortfalls. This requires careful planning on the part of utility companies, who need to estimate power consumption very accurately on the basis of historical trends and weather reports. However, getting the right amount of electricity out of a power plant is not just as simple (or complicated) as predicting demand.

Nuclear and coal-fired power plants are good at producing large amounts of electricity, but it can often take hours to start a plant back up after shutdown. In addition, they are slow to adjust their output, and are often designed in a way that efficiency is compromised if the plant's output falls outside of normal operating margins. As such, other kinds of power plants need to be able to make up for fluctuations in demand. Weather-dependent renewables, like wind and solar, are also subject to fluctuations based on local conditions, which can destabilize the situation even further. This instability is a significant obstacle to the widespread adoption of these sources of renewable energy in the U.S. When there is an excess of power on the grid, it often falls to other clean technologies like hydro power to cut back on their output, which is less desirable and leads to a greater carbon footprint.
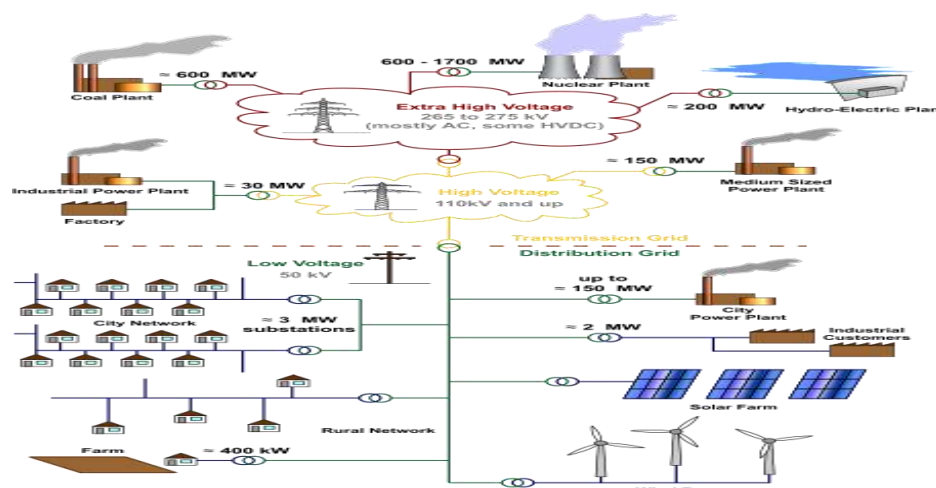
What approaches are currently used to deal with these issues?

During periods of peak demand, there are a number of strategies that utility companies use to keep up. Although there is no capacity for storage on the grid, energy companies can sometimes send excess energy to storage facilities, which can be tapped into later during times of need. Most of these are 'pumped-hydro' plants, which operate by pumping water uphill and storing the potential energy. Other methods include compressed air, thermal storage or even batteries. None of these methods are very efficient or cost-effective, however. The most common strategy is to fire up so-called 'peaker plants,' which are gas fired plants that can be quickly turned on and off so as to only operate during periods of peak demand. These plants tend to be older, less efficient plants that are expensive to maintain. If the peaker plants cannot generate enough electricity to keep pace with demand, utility companies often have options to pay large, industrial consumers to reduce their consumption temporarily until demand stabilizes, or importing electricity from their neighbors. Finally, to prevent a large failure, utilities can order 'rolling blackouts,' where parts of the grid lose power entirely for a period of time. The electric utilities will try to ensure that these blackouts are distributed relatively evenly for a period of time

What is the 'smart grid' and how can it help?

The 'smart grid' is a term for the collection of ideas, technologies, economic models, operating practices and more that would allow for a more efficient and more reliable electrical grid. The 'smart grid' would be characterized by more distributed power generation, with an emphasis on renewables and sustainable technologies, as well as a strong emphasis on information on both supply- and demand-side. In addition, inexpensive energy storage capacity would be increased. Distributed generation would emphasize the incorporation of local renewable energy sources, particularly solar and wind (which can be relatively easily incorporated into houses and local communities). This could provide both a more reliable local power supply, while also helping make the transition to a clean and sustainable energy economy.
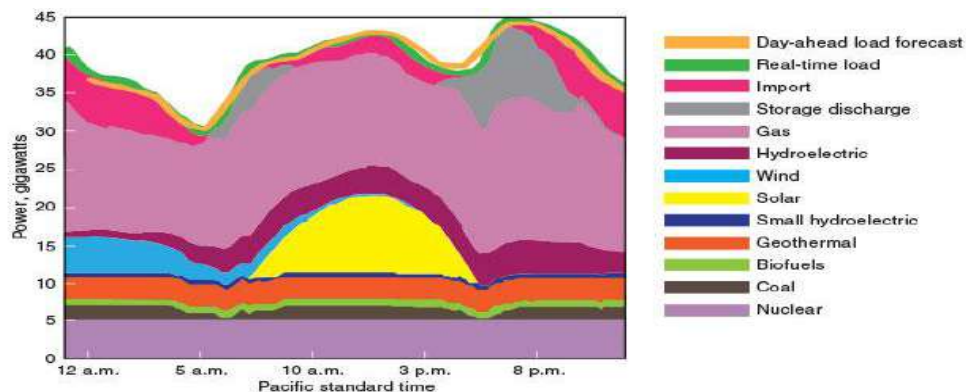
One promising focus is the idea of using two-way communication between utilities and smart devices/appliances as a demand response system. In the conventional model, devices and appliances are 'oblivious' to the needs of the electrical grid; they take the same power out regardless of whether or not there is an oversupply or shortfall of electricity. In a smart grid, devices and appliances could be equipped with smart technologies that could communicate with computers on the supply side, which would provide information about the current needs of the electrical grid. During supply shortfalls, a smart device/appliance would be able to reduce its power temporarily until demand and supply stabilize.

FIRST-EVER VISUALIZATIONS OF ELECTRICAL GATING EFFECTS ON ELECTRONIC STRUCTURE

- *Mr.D.Vairamuthu, Second Year EEE*

Electrons ejected by a beam of light focused on a two-dimensional semiconductor device are collected and analyzed to determine how the electronic structure in the material changes as a voltage is applied between the electrodes.
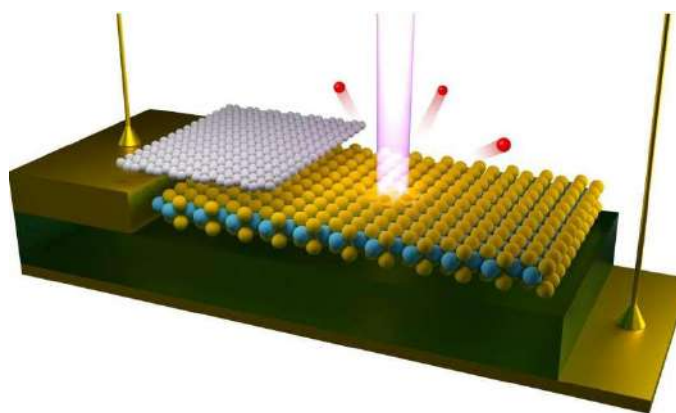
➤ Scientists have visualised the electronic structure in a microelectronic device for the first time, opening up opportunities for finely-tuned high performance electronic devices.

➤ Physicists from the University of Warwick and the University of Washington have developed a technique to measure the energy and momentum of electrons in operating microelectronic devices made of atomically thin, so-called two-dimensional, materials.

Using this information, they can create visual representations of the electrical and optical properties of the materials to guide engineers in maximising their potential in electronic components.

➢ The experimentally-led study is published in *Nature* today (17 July) and could also help pave the way for the two dimensional semiconductors that are likely to play a role in the next generation of electronics, in applications such as photovoltaics, mobile devices and quantum computers.

➢ The electronic structure of a material describes how electrons behave within that material, and therefore the nature of the current flowing through it. That behaviour can vary depending upon the voltage—the amount of 'pressure' on its electrons—applied to the material, and so changes to the electronic structure with voltage determine the efficiency of microelectronic circuits. These changes in electronic structure in operating devices are what underpin all of modern electronics. Until now, however, there has been no way to directly see these changes to help us understand how they affect the behaviour of electrons.

➢ By applying this technique scientists will have the information they need to develop 'fine-tuned' electronic components that work more efficiently and operate at high performance with lower power consumption. It will also help in the development of two dimensional semiconductors that are seen as potential components for the next generation of electronics, with applications in flexible electronics, photovoltaics, and spintronics. Unlike today's three dimensional semiconductors, two dimensional semiconductors consist of just a few layers of atoms.

➢ Dr. Neil Wilson from the University of Warwick's Department of Physics said: "How the electronic structure changes with voltage is what determines how a transistor in your computer or television works. For the first time we are directly visualising those changes. Not being able to see how that changes with voltages was a big missing link. This work is at the fundamental level and is a big step in understanding materials and the science behind them.

➢ "The new insight into the materials has helped us to understand the band gaps of these semiconductors, which is the most important parameter that affects their behaviour, from what wavelength of light they emit, to how they switch current in a transistor." Dr. Xiaodong Xu, from the Department of Physics and the Department of Materials Science & Engineering at the University of Washington, said: "This powerful spectroscopy technique will open new opportunities to study fundamental phenomena, such as visualisation of electrically tunable topological phase transition and doping effects on correlated electronic phases, which are otherwise challenging."

ULTRA-THIN LAYERS OF RUST GENERATE ELECTRICITY FROM FLOWING WATER

- *Mr.T. Vignesh Kumar, Second Year EEE*

➤ There are many ways to generate electricity—batteries, solar panels, wind turbines, and hydroelectric dams, to name a few examples… and now, there's rust. New research conducted by scientists at Caltech and Northwestern University shows that thin films of rust—iron oxide—can generate electricity when saltwater flows over them. These films represent an entirely new way of generating electricity and could be used to develop new forms of sustainable power production.

➤ Interactions between metal compounds and saltwater often generate electricity, but this is usually the result of a chemical reaction in which one or more compounds are converted to new compounds. Reactions like these are what is at work inside batteries.

➤ In contrast, the phenomenon discovered by Tom Miller, Caltech professor of chemistry, and Franz Geiger, Dow Professor of Chemistry at Northwestern, does not involve chemical reactions, but rather converts the kinetic energy of flowing saltwater into electricity.

➤ The phenomenon, the electrokinetic effect, has been observed before in thin films of graphene—sheets of carbon atoms arranged in a hexagonal lattice—and it is remarkably efficient. The effect is around 30 percent efficient at converting kinetic energy into electricity. For reference, the best solar panels are only about 20 percent efficient.

➤ Though rust will form on iron alloys on its own, the team needed to ensure it formed in a consistently thin layer. To do that, they used a process called physical vapor deposition

(PVD), which turns normally solid materials, in this case iron oxide, into a vapor that condenses on a desired surface. PVD allowed them to create an iron oxide layer 10 nanometers thick, about 10 thousand times thinner than a human hair.

➢ When they took that rust-coated iron and flowed saltwater solutions of varying concentrations over it, they found that it generated several tens of millivolts and several microamps per cm-2.

➢ "For perspective, plates having an area of 10 square meters each would generate a few kilowatt-hours—enough for a standard US home," Miller says. "Of course, less demanding applications, including low-power devices in remote locations, are more promising in the near term."

➢ The mechanism behind the electricity generation is complex, involving ion adsorption and desorption, but it essentially works like this: The ions present in saltwater attract electrons in the iron beneath the layer of rust. As the saltwater flows, so do those ions, and through that attractive force, they drag the electrons in the iron along with them, generating an electrical current.

➢ Miller says this effect could be useful in specific scenarios where there are moving saline solutions, like in the ocean or the human body.

➢ "For example, tidal energy, or things bobbing in the ocean, like buoys, could be used for passive electrical energy conversion," he says. "You have saltwater flowing in your veins in periodic pulses. That could be used to generate electricity for powering implants."

SMART TRAVEL ROBOT

- *Ms. P.Jesmila Jasmin, Second Year*

CleanseBot is the world's smart travel robot. CleanseBot is a smart robot with artificial intelligence and 18 sensors built in. It uses FOUR UV-C lamps to blast away 99.99% of germs and bacteria on any surface. Hotels are notorious for germs and bacteria and we won't want to worry about that when we are traveling for work or for fun! Just set the CleanseBot down on the bed, turn it on for either 30 or 60 minutes, it sanitizes and disinfects your bed sheets and blankets! Not only does CleanseBot kill germs, bacteria, and dust mites, but UV-C light has been proven in many studies to actually help prevent the spread of airborne viruses, too.

How Does it work:

Step 1:

For under Blanket Mode, pull the top and bottom halves of the CleanseBot apart to reveal the wheels. Set the CleanseBot wheels down on any surface and press the power button for turn on. It will clean on it's own for 30 or 60 minutes .Press the power button once for 30 minutes and twice for a 60 minutes run time.

Step 2:

In Handheld mode, simply put your hand under the strap and hold the power button for 3 seconds to turn it on. Press the power button again to turn on the downward facing UV-C lights. Then aim the lights at any surface or device, holding it, 1-3 inches away.

Step 3:

For Power Bank Mode, use the USB-C port to power any device.

Step 4:

For easy storage, put the handle cover back on the wheeled part of the CleanseBot, hold the power button for 3 seconds to turn off, and store. It's portable size means it can be kept easily in drawers, backpacks, and more.

Smart Al Sensors:

The CleanseBot will never get stuck in the bed or fall off of a bed. The CleanseBot has 18 smart AI sensors to keep the robot going. It is the world's first robot which focuses on sensors specifically for materials and fabrics and not simply hardwood or flat surfaces. The CleanseBot Team has tested the CleanseBot on more than 40 different types of materials and fabrics for sheets and blankets, as well as testing different sizes and shapes of beds, in order to gather and analyze all data and create the best AI and sensors. The wheels are patent-pending technology which can run over any surface. No other technology like this exists.

Third Party Tested:

The testing of CleanseBot with an independent third-party testing center, the Guang Zhou Institute of Microbiology and the Guangzhou Testing Center of Industrial Microbiology. The test results show that with only 30 seconds of exposure of UV-C light on the E. coli bacteria, the killing rate was greater than 99.99%. This proves how effective the CleanseBot is!

STUDENTS ACTIVITIES

S.NO	DEPT/CLUB	NAME OF THE STUDENTS	EVENT	DATE	ORGANISER OF THE EVENT
1	Camp	P.Suriya Ambika	Combined Annual Training Camp	12.08.2019 - 21.08.2019	Combined Annual Training Camp at Idayapatti
2	Sports	J.Vincent Denis	Zonal Sports Meet	19.08.2019 - 02.09.2019	PSN College of Engineering
		C.Rethish Kumar			
		M.Dinesh Kumar			
		A.Perumal Samy			
		S.Shanmuga Bharathi			
5	NCC	A.Gomathi Arasu	NCC Parade	14.08.2019	National Engineering College, Kovilpatti
		S.Kadalarasan			
		P.Balu			
		E.Manoj			
		M.PethuRaj			
		A.Mohamed Raziek			
		V.Vellaisamy			
		G.Vigneshwari			
		M.Subashini			
		S.Nandhini			

6	EEE	H.Selvadevi	Students League Representative-PALS	22.08.2019	National Engineering College, Kovilpatti
		T.Lavanya Narayani			
7	Sports	A.Venkadaramanan	Anna University Zone -18 Hockey Tournament	16.08.2019	National Engineering College, Kovilpatti
		A.Harish Kumar			
		M.Velmanikandan			
		A.Satheesh			
8	Sports	M.Aarthilakshmi	Zonal level Basket Ball & Volley Ball match	20.07.2019 - 30.08.2019	National Engineering College, Kovilpatti
		S.Meenakshi			
		U.Anisha Subhashree			
		K.Swetha			
		G.Vigneswari			
		M.Nivetha			
9	EEE	S.A.Ashfaaq Mohamed	Internship	29.07.2019 - 03.08.2019	Enthu Technology Solutions India pvt.Ltd,Coimbatore

PRESS CLICKS

நேஷனல் இன்ஜி., கல்லூரியில் மின்சார பாதுகாப்பு, சேமிப்பு விழிப்புணர்வு நிகழ்ச்சி

கோவில்பட்டி, செப். 4–

கோவில்பட்டி நேஷனல் இன்ஜி., கல்லூரி மின்னியல் மற்றும் மின்னணுவியல் துறையின் சமுதாய விழிப்புணர்வு மையம் சார்பில், கோவில்பட்டி அருகிலுள்ள பாண்டவர்மங்கலம் பஞ்., பொதுமக்களுக்கு மின்சார பாதுகாப்பு மற்றும் சேமிப்பு குறித்த விழிப்புணர்வு நிகழ்ச்சி நடந்தது.

நிகழ்ச்சிக்கு உதவி பேராசிரியர் குமார் வரவேற்று, சமுதாய விழிப்புணர்வு மையத்தின் முக்கியத்துவத்தை பொதுமக்களுக்கு எடுத்துக்கூறினார். மாணவர் அஜித் குமார் சுற்றுப்புறத்தில் மின் பாதுகாப்பு என்ற தலைப்பில் மின்கம்பத்திற்காக போடப்பட்ட ஸ்டே வயரின் மீது கயிறு கட்டி துணிகளை காயவைப்பதோ (அ) கால் நடைகளை கட்டுவதோ கூடாது என்றும், மழை காலங்களில் டிரான்ஸ்பார்மர்கள், மின்கம்பங்கள் அருகே செல்லக்கூடாது என்றும் கூறினார்.

இதனை தொடர்ந்து மாணவர் முருகன் மற்றும் குழுவினர் மின்சார சேமிப்பு முழக்கங்களை பொதுமக்களுக்கு எடுத்துக்கூறினார். மாணவர் அய்யாதுரை மற்றும் குழுவினர் மின்சாரத்தை பாதுகாப்பற்ற முறையில் பயன்படுத்தினால் ஏற்படும் விளைவுகளை நாடகமாக மாணவர்களுக்கு நடித்து காண்பித்தனர்.

ஏற்பாடுகளை கல்லூரி இயக்குனர் சண்முகவேல், முதல்வர் காளிதாச முருகவேல், மின்னியல் மற்றும் மின்னணுவியல் துறை தலைவர் வில்ஜூஸ் இருதயராஜன் ஆகியோரின் வழிகாட்டுதலின்படி ஆய்வக தொழில் நுட்ப வல்லுனர் சுப்புராஜ் மற்றும் துறை மாணவர்கள் செய்தனர்.

மின்சார பாதுகாப்பு, சேமிப்பு விழிப்புணர்வு நிகழ்ச்சி

கோவில்பட்டி, செப். 1: கோவில்பட்டி நேஷனல் பொறியியல் கல்லூரியின் மின்னியல் மற்றும் மின்னணுவியல் துறையின் சமுதாய விழிப்புணர்வு மையம் சார்பில் மின் பாதுகாப்பு மற்றும் சேமிப்பு குறித்த விழிப்புணர்வு நிகழ்ச்சி நடைபெற்றது.

பாண்டவர்மங்கலத்தில் நடைபெற்ற இந்நிகழ்ச்சிக்கு, கல்லூரி முதல்வர் காளிதாசமுருகவேல் தலைமை வகித்தார். மின்னியல் மற்றும் மின்னணுவியல் துறைத் தலைவர் வில்ஜூஸ்இருதயராஜன் முன்னிலை வகித்தார். மாணவர் அஜித்குமார் சுற்றுப்புறத்தில் மின்பாதுகாப்பு என்ற தலைப்பில் பேசினார். மாணவர் முருகன் தலைமையிலான குழுவினர் மின்சேமிப்பு குறித்து எடுத்துரைத்தனர். 3ஆம் ஆண்டு மாணவர் அய்யாத்துரை தலைமையிலான குழுவினர் மின்சாரத்தை பாதுகாப்பற்ற முறையில் பயன்படுத்தினால் ஏற்படும் விளைவுகளை நாடகம் மூலம் விளக்கினர்.

ஏற்பாடுகளை மின்னியல் மற்றும் மின்னணுவியல் துறையின் ஆய்வக தொழில்நுட்ப வல்லுநர் சுப்புராஜ் மற்றும் துறை மாணவர்கள் செய்திருந்தனர்.

Social Awareness Cell – Press and Publicity

EDITORIAL BOARD

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING