



FR. CONCEICAO RODRIGUES INSTITUTE OF  
TECHNOLOGY, VASHI

EESA

ELECTRICAL ENGINEERING STUDENTS ASSOCIATION 2015-2016

presents

e o s m o s

## EESA CORE COUNCIL 2016



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KARTHICK SHARAN - EDITOR



SHRUTHI UNNIKRISHNAN - EDITOR

## **EDITORS' NOTE**

*There's an old joke: if you tell someone the universe is expanding, he'll believe you. If you tell him there's wet paint on the park bench, he'll want to touch it to make sure...*

The joke above is usually told as a commentary on how the ideas of science are far removed from the concerns of ordinary people, but I see a more encouraging lesson embedded in this wry little observation. Anyone who has the impulse to check whether the paint is wet has exactly the right kind of instincts for doing science: a ready curiosity, a desire to gather empirical evidence, a willingness to get dirty in order to put a theory to the test. The inquisitive souls who have made it into the academic science world will find no shortage of practical ends for even esoteric types of research—the curative applications are celebrated in this magazine issue. Various events directed towards solution of electrical faults, bringing out it's at most effectiveness were held throughout the event TRANSIENT 2k16.

But those who stand outside of the research world have a growing number of ways to contribute as well. The fabulous art work, excellence in outdoor sport events was just an awe striking moment for us so as to conclude how efficient the students actually are!

In short, the gap between the park bench and the expanding universe—always smaller than it seemed—is getting smaller. And this year, in our edition of “COSMOS”, the team members are doing their part to bring one of the most remote ideas in cosmology back down to Earth. “Other universes and other dimensions?” In our view, it's not so far from a walk in the park.

## **EDITORIAL TEAM**

Shruthi .E  
Sheryl Jacob  
Karthick Sharan

## FROM THE H.O.D'S DESK



“Education is not the preparation for life, education is life itself.”

Education, is a process of inviting truth and possibility, of encouraging and giving time to discovery. It is, a social process – ‘a process of living and not a preparation for future living’. In this view educators look to act with people rather than on them. Their task is to educe, to bring out or develop potential.

Teaching or Educating must be based upon student's needs, nature and environment. We as an educational institute strive hard to help our students excel in every field by creating opportunities for the same by conducting events that open up the students to whole lot of activities and experiences.

Sometimes we might take some harsh steps which you as students might not like but you must always keep in mind that these steps are because of our care for you and the will that you succeed in every aspect of life.

I am taking this opportunity to congratulate the convener and the council members of EESA 2016 for their contribution in organizing various programs and also the efforts they have put in releasing the EESA magazine "COSMOS".

DR. SINCY GEORGE  
(Head of Department, Electrical Engineering )

# DEPARTMENT OF ELECTRICAL ENGINEERING

Electrical engineering is a professional engineering discipline that deals with the study and application of electricity, electronics and electromagnetism.

Out of the very few colleges under Mumbai University, FCRIIT-Vashi has always got a 'go to' approach as far as electrical engineering is concerned, delivering university toppers every year.

The electrical department was established in the year 1994 with an intake of 40 students, which increased to 60 in the consecutive years. Our department has well equipped proper functioning laboratories like BEE (Basic Electrical and Electronics) lab, electrical machines lab, PSP (Power System Protection) lab, controls lab and MATLAB and also has the computers installed with advanced softwares like SCADA and ETAP.

The faculty of our department is extremely qualified and supportive. The department also boasts an excellent library with a huge lot of reference books catering to the needs of the students and the faculty.

## FACULTY TEAM

The Electrical department of F.C.R.I.T. is equipped with best of faculty and supporting staffs which are the enduring pillars of the department.

The department comprises of:

<b>Professors</b>	<b>2</b>
<b>Associate Professors</b>	<b>4</b>
<b>Assistant Professors</b>	<b>13</b>
<b>Lab Assistants</b>	<b>5</b>
<b>Total</b>	<b>24</b>

## STAFF ACHIEVEMENTS ( 2015-2016 )

### ❖ INTERNATIONAL JOURNALS

Sr. No.	Title of paper	Details	Name of Staff	Academic Year
1	Power factor and Harmonic analysis in single phase AC to DC converter	International Journal of Engineering Research and Technology, ISSN:2278-0181, Vol 4, Issue 4, April 2015	Divya S	April 2015
2	Single phase transformer less inverter and its closed loop control for Grid connected PV applications	International Journal of Electrical electronics and Computer systems (IJEECS) ISSN:2347-2820, Vol 3, Issue 5, 2015	Mini Rajeev	May 2015
3	Controller Area Network Assisted Grid Synchronization of a Microgrid with Renewable Energy Sources and Storage	Accepted for publication in IEEE Transaction on Smart Grid, August 2015	Dr. Sushil Thale	August 2015

### ❖ NATIONAL AND INTERNATIONAL CONFERENCE

Sr. No.	Title of paper	Details	Name of Staff	Academic Year
	Robust Sliding mode controller for PV connected converter inverter system	2 <sup>nd</sup> International Conference on Emerging Trends in Technology and Applied science, SAINTGITS college of Engg, Kottayam, Kerala	Mini N	30 <sup>th</sup> April, 1-2 May, 2015

2	Design and Implementation of 3 phase Inverter for Renewable Energy Source with Unified Control Strategy	Accepted at 5 <sup>th</sup> International Conference on Advances in Energy Research (ICAER 2015) to be held at IIT Bombay, Powai, Mumbai from 15-17 December, 2015.	Sushil Thale	August 2015
3	Design and implementation of a DC Microgrid with multiple sources	National Conference on Nascent and Advanced Technologies, IETE Navi Mumbai Centre, August 201	Sushil Thale	August 2015
4	Investigation into Selection and Sizing of Energy Storage for Designing of Dispatchable Solar PV System,	National Conference on Nascent and Advanced Technologies, IETE Navi Mumbai Centre, August 2015	Sushil Thale	August 2015
5	Active Generation Management and Load Management for Standalone Solar Photovoltaic System,"	National Conference on Nascent and Advanced Technologies, IETE Navi Mumbai Centre, August 2015.	Sushil Thale	August 2015
6	A Performance comparison of Interleaved Boost converter and conventional boost converter	Think quest 2 <sup>nd</sup> International Conference on Contours of Digital Technology, ICCDT-2015, Mumbai	Mohini Kher	11, Oct 2015
7	A comparative simulation study of Converter Topologies used in low ripple High power applications	Think quest 2 <sup>nd</sup> International Conference on Contours of Digital Technology, ICCDT-2015, Mumbai	Divya M	11, Oct 2015

8	Direct Torque Control of Induction Motor using Four Switch Three Phase Inverter	International Conference on Recent Trends and Innovations in Engineering and Technology, May 1, 2, PACE, A.P	Bindu R	May 1, 2, 2015
9	Modelling and Control of Switched Reluctance Motor for Hybrid Electric Vehicle	International Conference on Recent Trends and Innovations in Engineering and Technology, May 1, 2, PACE, A.P	Bindu R	May 1, 2, 2015
10	Sensorless Vector Control of Three Phase Induction Motor	International Conference on Advances in Communication and Computing Technologies	Bindu R	10,11 August 2015
11	A simulation analysis of MPPT algorithm in Photo voltaic system using Cuk converter	2 <sup>nd</sup> International Conference on Emerging Trends in Technology and Applied science, SAINTGITS college of Engg, Kottayam, Kerala	Sincy George	30 <sup>th</sup> April, 1-2 May, 2015
12	Performance comparison of converters for HVDC application	2 <sup>nd</sup> International Conference on Emerging Trends in Technology and Applied science, SAINTGITS college of Engg, Kottayam, Kerala	Sincy George	30 <sup>th</sup> April, 1-2 May, 2015
13	Analysis of Distributed Maximum Power Point Tracking of PV system under Partial Shading condition		Mahendra Rane	
14	Modelling of a Bipolar solid state	International Conference on Recent	Bindu S	May 1, 2, 2015



	Marx generator including the Parasitic capacitor effect	Trends and Innovations in Engineering and Technology, May 1, 2, PACE, A.P		
15	Design and simulation of Unipolar Solid state Marx generator	Thinkquest 2 <sup>nd</sup> International Conference on Contours of Digital Technology, ICCDT-2015, Mumbai	Bindu S	11, Oct 2015
16	Optimization in switch utilization for solar based water sprinkler and moisture sensor- A case study	Thinkquest 2 <sup>nd</sup> International Conference on Contours of Digital Technology, ICCDT-2015, Mumbai	Rashmi Kale	11, Oct 2015
17	Selection and Design of DC-DC converter for solar battery charging of Electric vehicle	Thinkquest 2 <sup>nd</sup> International Conference on Contours of Digital Technology, ICCDT-2015, Mumbai	Rashmi Kale	11, Oct 2015
18	Simulation of PMBLDC motor using Artificial Neural Network	International conference on Industrial Engineering ICIE 2015	Sreedevi Nair	2015
19	Introduction to Multilevel inverter and Comparison of switching strategies for Cascaded half bridge multilevel DC-link inverter	International conference at Rizvi College of Engineering, International Journal Of Global Technology and Initiatives (IJGTI)	Mini Rajeev	29-30 March 2016
20	Interleaved Buck Converter with Low Output Current Ripple using Model Predictive Algorithm	International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16)Karpagam college of	Divya M	17 and 18 March 2016.

		Engineering Coimbatore		
21	Close loop Speed control of PMBLDC motor using Artificial Neural Networks	International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16)Karpagam college of Engineering Coimbatore	Sreedevi Nair	17 and 18 March 2016.
22	Design and Development of Electric Vehicle Battery Charging Using MIMO Boost Converter	International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16)Karpagam college of Engineering Coimbatore	Rashmi Kale	17 and 18 March 2016.
23	Selection of Motor Drive Assembly for A Bucket Elevator Application	International Journal Of Global Technology and Initiatives (IJGTI) International Conference at Rizvi Conference proceedings,	Mohini Kher	29-30 March 2016
24	Utility system unbalance in single phase electric Traction -A Review	International Journal Of Global Technology and Initiatives (IJGTI) International Conference at Rizvi Conference proceedings, 29-30 March 2016	Poornima Rao, Divya S	29-30 March 2016
25	Direct Torque Control of Three Phase Induction Motor using Space Vector Modulation Technique	International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16)Karpagam college of	Mr. Rajendra Soni,	17 and 18 March 2016.

		Engineering Coimbatore		
26	Design and simulation of a DC-DC converter for Marx Generator using Solar PV	International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16)Karpagam college of Engineering Coimbatore	Sincy George	17 and 18 March 2016.
27	Design and Implemenation of DSP based Unipolar Solid state Marx generator	IEEE sponsored International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16) Karpagam college of Engineering Coimbatore	Bindu S	17 and 18 March 2016.
28	Current Harmonics Reduction using Sliding Mode Control based shunt Active power filter	10 th international conference on Intelligent systems and Control (ISCO-2016).	Mini N	FH 2016
29	Control of Switched Reluctance Generator in Wind Energy system	IEEE sponsored International conference on Innovation in Information Embedded and Communication Systems (ICIIECS-16)Karpagam college of Engineering Coimbatore	Bindu R and Sincy George	17 and 18 March 2016.

## STUDENTS' ACHIEVEMENTS

### ❖ CAMPUS PLACEMENTS (2015-2016)

COMPANY	NO. OF STUDENTS PLACED	PACKAGE (in lakhs)
TCS	16	3.18
L & T ltd	4	4.88
Udhe	2	4.1
Petrofac	2	5.5
Jacobs	4	3.2
Godrej	2	4.5
IGATE	3	3.2
ATOS	5	3.4
Technimont	1	4.0
Mukund	1	4.5
Asian Heart Institute	3	3 to 4

### ❖ FINAL YEAR RESULT (2015, SEM 7)

NAME	SGPA
1. Saylee Koli	10
2. Mrunal Limaye	10
3. Jeny Ann Mathew	9.7

## MINI PROJECT

Electrical Engineering Department organizes a mini project competition every year for the 2<sup>nd</sup> year students to introduce them to the various challenges that come up during group projects and to provide a platform for them to apply their theoretical knowledge and practical skills.

Here is the list of winners:

POSITION	NAMES	TOPIC
1 <sup>ST</sup> PRIZE	Shailesh Yadav Nikhil Vardekar Arijit Sharma Abhishek Yeole	Train Signaling System
2 <sup>ND</sup> PRIZE	Brayan Fernandes Akshay Tawade Dattatray Honyalkar Saikiran Chari	Fire Rescue System Using Eddy Current
3 <sup>RD</sup> PRIZE	Nachiket Khandekar Prashant More Dheeraj Gunjal Chetan Pednekar	Digital Stop Watch

## VIDYUT 2015

Electrical engineering department strives hard to keep its students aware about the recent developments in the electrical engineering field. People with thorough knowledge and experience in industries are invited to share their knowledge and experience with the students.

Vidyut, a daylong event, also proves an excellent platform for the students to interact with the people with their industrial background. Following are the lists of seminars held under Vidyut 2015-16:

### ❖ SECOND HALF OF 2015

Business Environment – Electrical Sector- By Mr. Rahul Shah, Tata Power Renewable Energy Ltd.

Clean Technology And Challenges – By Mr. Sydney Lobo, Tata Power Renewable Energy Ltd.

Protection Philosophies and Case Studies- By Mr. Muralikrishnan T.

### ❖ FIRST HALF OF 2016

Semester IV- Success & Happiness With Emotional Intelligence - By Mr. E.V. Swaminathan

Semester VI- Ac Traction- By Mr. Sudhir Patil

Semester VIII- Fundamentals Of Industrial Safety And Accident Prevention- By Mr.N.N.Pisharody

## LECTURE SERIES

Making the best use of well qualified, experienced and dedicated faculty the department believes in sharing knowledge among the staff as well as the students. Lecture series gives students a chance to learn something beyond the syllabus. The topics taken up were:

Voltage Control Of Bulk Using Sliding Mode Control	<b>Mini N.</b>
Witricity	<b>Sreedevi Nair</b>
Different Topologies For Low Ripple Dc Source	<b>Divya M.</b>

## EXPERT LECTURES

While industry visits and academia are important aspects of knowledge building, there is one realm where students can learn a lot from the expert lectures conducted by eminent personalities from academic world and reputed organizations to share their knowledge and experience with budding minds.

We have had in our college:

Semester IV - Mr. Sushil Tale – Analog And Digital Integrated Circuits

Dr. Sincy George - Application Of Electronics In Electrical Energy

- Semester VI - Miss Mini N. – Sliding Mode Control  
 Mr. Balagopal P., Manager, Citi Bank – Financial Analysis In Project Management.  
 Mr. Sagar Kher – ‘Maintenance Of Synchronous Generator’- Tata Power  
 Mr. Akhilesh Chandrakar – ‘Synchronous Generator Protection’- Tata Power
- Semester VIII- Mr. Abhishek Sahdev – Electric Drives And Its Application  
 Prof. Ninad Totare – Power System Restructuring



Seminar on Financial Analysis in Project Management.

## **INDUSTRIAL VISIT**

To Enhance Student’s learning and a way to gain first-hand information regarding application of instrumentation and control in process industry. In other words, it is the ideal way of practicing the theory.

<b>Semester III</b>	Thermal power plant, Murbad
<b>Semester IV</b>	Shrihans Electricals Pvt. Ltd., Taloja
<b>Semester V</b>	DOL Electricals Co. Pvt. Ltd., Rabale
<b>Semester VI</b>	Sanpada Locoshed, Central Railway, Sanpada
<b>Semester VII</b>	PCB Manufacturing company, Goa
<b>Semester VIII</b>	Switchgear training Centre, Larsen & Toubro, Pune

## EESA ENDEAVOURS

### ❖ TEACHER'S TALK

Not just the taking in of a professor's teaching is important but the delivering of the same is equally necessary for a student. One such task is the paper presentation, and to help us know how to do it we organized talks with the experienced professors of our department.

Sr. no.	Presentation on	Sem	Date
1.	“How to write a Technical Paper” by Dr. Sincy George	V	11/09/2015
2.	“How to do literature survey for Technical Paper Writing” by Dr. Bindu S.	V	14/09/2015
3.	“Understanding the needs and challenges of Hardware Projects” by Dr. Sushil Thale	III	15/09/2015



Seminar by Dr. Sincy George on “How to write a Technical Paper”



## ❖ UPA YOGA

The Yoga session was one of the major cultural attractions under EESA conducted by the 'ISHA' foundation. Teaching us the holistic way of life the Yoga Aasanas were truly enriching and rejuvenating.



## TRANSIENT 2K16

EESA is an organisation that aims at all round development of electrical engineering students technically and culturally. EESA conducted workshops and events under fest named TRANSIENT 2K16, a techno-cultural fest for electrical students only.

### **1. Robotics Workshop:**

For all the robotics enthusiasts a workshop was conducted by the senior students on level 1 and level 2 Robotics. Students were introduced to the technologies and various components required for making a robot and their application in the 21<sup>st</sup> century. In the workshop, the students were provided with a kit of level 1 robotics and were guided to make their own robots.

Event Heads: Suresh Choudhary, Cyril Joy, Nikhil Vardekar

## 2. Brain Pop [Quiz]:

Time to put the brains to test!! Challenging their knowledge, students were tested upon current affairs, mathematical, logical and technical grounds.

Event Heads: Salil Patwardhan , Joson Mathew

Winners: 1<sup>st</sup> Prize- Leo K. and Gaurav G. (ELEC-4)

2<sup>nd</sup> Prize- Aditya G. and Kapil C. (ELEC-4)

## 3. Melt The Metal [Soldering]:

This competition was aimed to test how good one is at soldering electrical components. The participants were given an electric circuit which was to be mounted and soldered as quickly as possible.

Event Heads: Dattatray H , Akshay Tawade

Winners: 1<sup>st</sup> Prize- Manish K. and Prashant M. (ELEC-6)

2<sup>nd</sup> Prize- Atharva A. and Roshal F. (ELEC-6)

## 4. Pirates of Circuit [Finding the Faults]:

A technical event comprising of two rounds wherein participants were given a wrong circuit mounted on a breadboard and were shown the correct circuit diagram for a few seconds to identify the fault in the bread board provided and rectify it.

Event Heads: Anant Narkhede , Arijit Sharma , Chirag Raote

Winners: 1<sup>st</sup> Prize- Ashwini Y. and Mitesh K. (ELEC-6)

2<sup>nd</sup> Prize- Sumit Y. and Ishani N. (ELEC-6)



## 5. Fifa LAN Gaming:

Some time off studies was a complete non-technical event for all the gamers to get their hands on the controllers or game consoles. A local area network is established for playing multiplayer video game and individuals compete against each other.

Event Heads: Srijit Saha , Bhushan Patil

Winners: 1<sup>st</sup> Prize- Akshay M.(ELEC-8)

## 6. Cricket Tournament:

To not leave any stone unturned we also have our own sports tournament under the banner of 'Transient'. The best teams from all the semesters of the electrical department participated and a rigorous session of 11 matches were played. Each of the teams played with all their might and enthusiasm conforming to true sportsmanship. The tournament was won by the students of 4<sup>th</sup> year and the runner up was the 3<sup>rd</sup> year's team of students.



4<sup>th</sup> year students celebrating their victory.

# ARTICLES

## Li-Fi : A Revolution in Future Technology

Arnab Panja,  
*Department of Electrical Engineering  
Fr. C.R.I.T, Vashi .*

### **I. INTRODUCTION**

Most of us are familiar with Wi-Fi (Wireless Fidelity), which uses 2.4-5GHz RF to deliver wireless Internet access around our homes, schools, offices and in public places. We have become quite dependent upon this nearly ubiquitous service. But like most technologies, it has its limitations.

While Wi-Fi can cover an entire house, its bandwidth is typically limited to 50-100 megabits per second (Mbps) today using the IEEE802.11n standard. This is a good match to the speed of most current Internet services, be it the normal gprs or be it the wi-fi.

### **II. WHAT LI-FI STANDS FOR?**

Li-Fi comprises a wide range of frequencies and wavelengths, from the infrared through visible and down to the ultraviolet spectrum. It includes sub-gigabit and gigabit-class communication speeds for short, medium and long ranges, and unidirectional and bidirectional data transfer using line-of-sight or diffuse links, reflections and much more. It is not limited to LED or laser technologies or to a particular receiving technique. Li-Fi is a framework for all of these providing new case.

### **III. HOW LI-FI WORKS?**

Imagine yourself walking into a mall where GPS signals are unavailable but the mall is equipped with ceiling bulbs that create their own 'constellation' of navigation beacons. As the camera of your cellphone automatically receives these signals, it switches your navigation software to use this information to guide you to the ATM machine you're looking for. You conclude your ATM transaction and notice the Giga Spot sign for instant digital movie downloads. Using the visible light spectrum, Li-Fi technology can transmit data and unlock capacity which is 10,000 times greater than that available within the radio spectrum. The visible light spectrum is plentiful, free and unlicensed, mitigating the radio frequency spectrum crunch effect.

### **IV. THE FUTURE INTERNET**

Li-Fi technology will in future enable faster, more reliable internet connections, even when the demand for data usage has outgrown the available supply from existing technologies such as 4G, LTE and Wi-Fi. It will not replace these technologies, but will work seamlessly alongside them.

Using light to deliver wireless internet will also allow connectivity in environments that do not currently readily support Wi-Fi, such as aircraft cabins, hospitals and hazardous environments.

### **V. A DUAL USE FOR LED LIGHTING**

The wide use of solid state lighting offers an opportunity for efficient dual use lighting and communication systems. Innovation in LED and photon receiver technology has ensured the availability of suitable light transmitters and detectors, while advances in the modulation of communication signals for these types of components has been advanced through signal processing techniques, such as MIMO, to become as sophisticated as those used in mobile telecommunications.

### **VI. AN INTEGRATED COMMUNICATION SOLUTION**

Li-Fi technology is being developed into a ubiquitous systems technology, consisting of application specific combinations of light transmitters, light receivers including solar cells, efficient computational algorithms and networking capabilities that can be deployed in a wide range of communication scenarios and in a variety of device platforms.

### **VII. REFERENCES**

- [1] <http://www.yuvaengineers.com/li-fi-technology-in-wireless-communication-revathi-ganesan/>
- [2] V. Dhakane, R. Nimbalkar, "Light Fidelity: A Reconnaissance in Future Technology

# TRANSMISSION AND DISTRIBUTION OF ELECTRICITY IN INDIA

Arijit Sharma  
Salil Patwadhan  
*Department of Electrical Engineering  
Fr. C.R.I.T, Vashi .*

## **ABSTRACT :**

Changes in the electric utility industry will continue to force the distribution planning function to evolve. This paper presents the future needs of electric utility distribution planning . In looking ahead at the next two decades, we will consider various options that are available and highlight the one shaving the potential for major improvements. The broad range of topics covered include infrastructure like electrical insulators and smart cables, technologies like single phasing, FACTS (Flexible AC Transmission Systems), SCADA(Supervisory Control and Data Acquisition), new distribution planning models, and consumer interfaces. The barriers in adopting these technologies are also explored.

The transmission and distribution play a vital role in the power system bt it's the system as a whole in lossy in nature so to it reliable the T & D system should be very well equipped with **SQRA: Security, Quality, Reliability and Availability**. Also the power system of the future should enable utilities to provide better service, better manage their assets , extend equipment life, Improve diagnostics A good insulator (dielectric) must meet two primary requirements: It must have an electrical resistivity and a dielectric strength sufficiently high for a given application

## **FACTS :**

Flexible AC Transmission Systems(FACTS) is a new upgrade technology that can increase the use-capacity of existing transmission and distribution lines..

## **SCADA and Distribution Automation**

This basically supervises the overall control of power system(supervisory control)

## **CONCLUSION:-**

System will become reliable.  
Easy interaction with customers will be possible

## **REFERENCES:-**

- World Energy Council Report on T & D in India
- Government of India Central Electricity Authority Ministry of Power

# NUCLEAR FURUTE OF INDIA

Suresh Choudhary  
Department of Electrical Engineering  
Fr. C.R.I.T, Vashi .

Although non-renewable, Nuclear power now seems to be the most promising source of power generation all over the world. One of the major reasons India not to be the Vito-Power is the lack of nuclear programs in the country. Therefore it has now become an utmost importance to take into consideration the factors causing hindrances in the growth of nuclear generation in order to cope up to the esteem level. There are three factors as to why the answers to these questions will be negative: history, technology, and economics. Politics, at different levels, could also affect the future in different ways.

The Department of Atomic Energy (DAE) has a long history of making extravagant projections, none of which have been fulfilled despite extravagant budgets. By 1960, the prediction was that, there would be 43.5 GW installed capacity by 2000. Actually installed capacity was about 600 MW in 1980 and 2,720 MW in 2000.

There is at least one good technical reason why these targets are unlikely to be met. The DAE's plans involve constructing hundreds of fast breeder reactors; the much touted three stage nuclear program. In the words of Admiral Hyman Rickover, the founder of the U.S. naval nuclear submarine program, his experiments with breeder reactors showed that they were "expensive to build, complex to operate, susceptible to prolong shutdown as a result of even minor malfunctions, and difficult and time-consuming to repair."

A shift to imported light water reactors from the West brings with it a dilemma, as these tend to be much more expensive to construct than the DAE's heavy water reactors. This would make nuclear electricity uncompetitive.

The final factor, politics, at the grassroots levels, will be yet another constraint to the expansion of nuclear power, as there has been significant opposition to every new nuclear reactor and uranium that has been planned since the 1980s. **Following are the major factors to be considered for future nuclear power generation expansion:-**

- **Independent oversight:** Two credible people said that I was too critical of the Department of Atomic Energy (DAE) and particularly the current regulatory authority, the Atomic Energy Regulatory Board (AERB), which they said has been doing its job "without fear or favour."
- **Risks and reality:** The probability of a nuclear catastrophe may be very low but is not zero. How can we expose people to such a risk? Indeed, statements from the DAE like "Koodankulam is 100% safe" are not credible and a proper risk assessment is required.



## **Nuclear reactor explosion at Fukushima, Japan**

- **Emergency preparedness and liability:** In the event of a disaster at Koodankulam, it is impossible to evacuate such an area rapidly, and medical facilities are inadequate. Cyclones, floods, industrial accidents all occur regularly and we have not learned our lessons.
- **Local consent and involvement:** In such projects, to what extent is local people's consent required? This is perhaps the trickiest point of all. The needs of the many can conflict with the needs (and rights) of the few.
- **The future:** Unwarranted scaremongering is a problem on all sides. S.P. Udayakumar claims in his "Thirteen Reasons Why We Do Not Want the Koodankulam Nuclear Power Project" that the radiation from a nuclear plant's normal operation is dangerous, that coolant waste will affect fish populations.

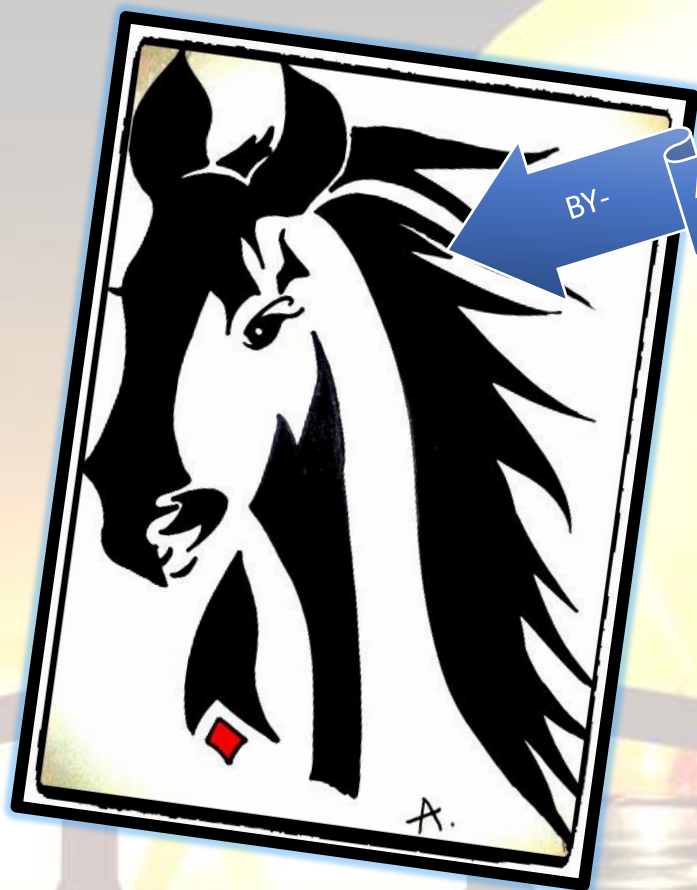
## CREATIVE CORNER:

### MIGHTY ELECTRON

Gushing through the lines  
Electrons are like mines  
From the smallest L.E.Ds  
To the largest cities  
Every “thing” comes alive  
Every “living being” survive  
If it not were Tesla  
We’d still be living in the dark  
Lighting candles, while searching spark  
What about the switch ?  
On/off, 1/0, high/low, open/close  
Could this have ever made  
One click on computer, our daily dose ?  
Miles and miles away  
Electron reach without dismay  
And like a branch from a tree  
To our house, comes the electricity  
And for centuries to come  
Would it keep the pace  
For centuries that passed by  
None could ever displace  
That tiny but mighty electron  
That complex electrical system  
Depend upon...

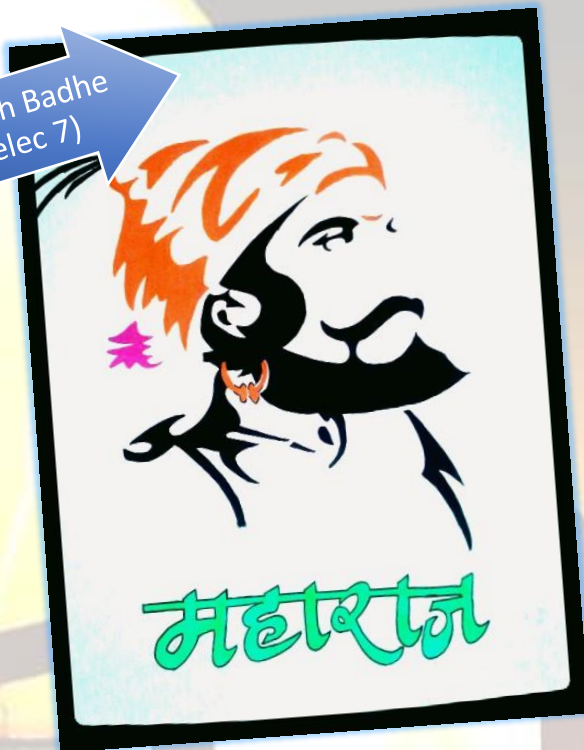
Ashwarya Agarwal  
ELEC (SEM 8)

ART GALLERY :



BY-

Akash Badhe  
(elec 7)



BY- Shruthi . E (elec 7)



## EESA COUNCIL 2K15-16

SR NO.	NAME	POST
1	ARNAB PANJA	CHAIRPERSON
2	AAYUSH NAUTIYAL	SECRETARY
3	TEJALI VALKUNDE	ASST. SECRETARY
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5	SHRUTHI UNNIKRISHNAN	EDITOR
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11	SALIL PATWARDHAN	PROGRAM COORDINATOR
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