



# URJA 2013-14



Electrical & Electronics Engineering Department E-Magazine



<b>Wireless Power System</b>
<b>Solar Tuk Tuk</b>
<b>Steps Towards Success</b>

# CONTENTS

❖ Editorial Board, Teacher Coordinator & Student Coordinators

❖ Director's Message

❖ HOD'S Message

❖ Articles

## Editorial Board



❖ Faculty Coordinator: Ms. Ankita Singh

❖ Editor- in-Chief: Ms. Neha Singh

❖ Co-Editors : Mr. Rajat Singh Chandel

# Principal Message



Technical Education is the most potential instrument for socio-economic change. Presently, the engineer is seen as a high-tech player in the global market. Distinct separation is visible in our education between concepts and applications. Most areas of technology now change so rapidly that there is a need for professional institutes to update the knowledge and competence.

Institute of Engineering and Science, IPS Academy is a leading, premium institution devoted to imparting quality engineering education since 1999. The sustained growth with constant academic brilliance achieved by IES is due to a greater commitment from management, dynamic leadership of the president, academically distinctive and experienced faculty,

Disciplined students and service oriented supporting staff. The Institute is playing a key role in creating and ambiance for the creation of novel ideas, knowledge, and graduates who will be the leaders of tomorrow. The Institute is convinced that in order to achieve this objective, we will need to pursue a strategy that fosters creativity, supports interdisciplinary research and education. This will also provide the students with an understanding and appreciation not only of the process of knowledge creation, but also of the process by which technology and knowledge may be used to create wealth as well as achieve social economic goals.

I am delighted to note that the engineering graduates of this institute have been able to demonstrate their capable identities in different spheres of life and occupied prestigious position within the country and abroad. The excellence of any institute is a measure of achievements made by the students and faculty.

**Dr. Archana Keerti Chowdhary**  
**Principal**

## HOD'S Message



Our Country is passing through a critical phase of growth. If you take an over view of this growth, we find that we are developing new energy dimension and electrical energy plays the most vital part in total energy context. In fact, electricity is taking the role of indispensable energy form of our daily life. Ours is the sixth largest country in terms of global energy consumption. The last decades of economic growth of our country has brought an unprecedented demand for energy. The installed electrical generating capacity of our country stands at 162366 Megawatts in 2010, and is projected to be 950000 MW by 2030. This large scale use of electrical energy will definitely demand a large team of electrical engineers to manage its use. All the same there is continuous pressure of balancing our ecology especially in context to global warming. This is forcing to ensure efficient use of electrical energy. Electronic power control is offering new tools in management of electrical energy.

Electrical and Electronics engineering together is a dedicated branch of engineering to fulfill all challenges of electrical energy futures.

**Prof. B.N. Phadke**  
**HOD**

## **10 of the Biggest Trends in Technology For 2014**

It's often difficult to keep up with the rapidly developing technology industry, as new items and groundbreaking technologies are introduced to the market almost on a daily basis. Not only staying up-to-date with today's technology, but also remaining ahead of the curve, involves a constant struggle in today's marketplace. Regardless of how you are connected to these trends in technology, there are electrical engineers in the middle of all the action. With the stage set for an exciting 2014, Here are some technology trends for the upcoming year.

### **1. Data Privacy**

There is certainly a lot of talk surrounding the NSA snooping revelations, and data privacy is becoming more important than ever. In several instances, there are entire services and businesses emerging as "data-free," including Microsoft going to the extent of publicly denouncing the practice and pledging to work on encryption that prevents the NSA and other agencies from collecting personal data.

### **2. The Web of Things**

In many ways, this is still in the beginning stages of development when looking at the potential impact that this technology can have on the future. Here, just about everything we interact with becomes a computable entity, allowing our smartphones to seamlessly connect with our homes, cars, and even objects on the street.

### **3. Ultra HD 4K Will Spread to Television and Phones**

Improved mobile devices will be released that include Qualcomm Snapdragon 800 processors by the end of 2014, which can handle 4K video and completely revolutionize the way video will be viewed. Proof that this is happening now is the fact the both the FIFA World Cup and the Winter Olympics are being filmed in 4K, along with more content being released via Netflix, Sony and others throughout 2014.

### **4. No-Touch Interfaces**

Many smartphone users are already familiar with no-touch technology thanks to voice recognition software integrated into their wireless devices. Smartphone users use apps like Google Now on

Android and Siri on iOS for hands-free access to endless amounts of information. With advances in sensors and cameras, no-touch interfaces and devices will only continue to be integrated into daily life.

### **5. 3-D Printing**

The growth rate of 3-D printers is projected to be 75 percent this year, with another large jump to 200 percent by 2015. Once thought to be impossible, the consumer market is now aware that 3-D printing is a real and viable means to reduce costs through improved designs, streamlined prototyping, and short-run manufacturing.

### **6. Wearable Technology**

This technology is all the rage at the moment, but it is not a technology that will illuminate smartphones anytime soon. This technology involves a number of items and is a fast-growing category that includes any small piece of technology that can be worn on one's body. Research firm ABI estimates that this industry will hit \$6 billion by 2018.

### **7. Large Cloud Services**

Companies like Facebook, Walmart and Amazon have created a major force towards database systems and cloud services. From "eco-friendly" data centers to custom server hardware to distributed computing methods, these companies are using their strengths and capabilities to set new standards for IT architecture.

### **8. Personal Cloud Services**

Because of the continued push for more personal cloud technologies, this trend will continue to evolve and shift more towards services and away from devices. These improved capabilities will make it even easier when having multiple devices accessing the personal cloud, and, in theory, will make overall data organization much easier in the very near future.

### **9. Online Video Streaming**

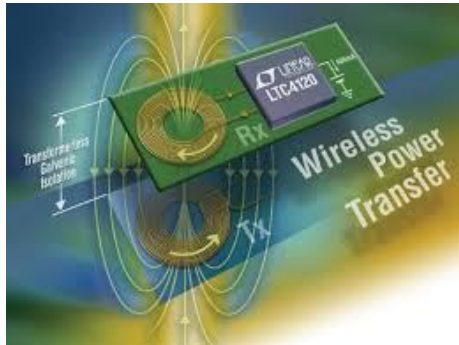
With the demand of streaming video from the broadcast networks, your computer is no longer used to simply learn and laugh along with your favorite YouTube videos. The future of online streaming is happening at a remarkable speed. Data downloads are currently at about 17GB per month, but this number is expected to exceed 70GB per month by 2017. The future lies with the HEVC (High Efficiency Video Coding), which is the video compression technology that will make streaming 4K videos possible.

## 10. Social Networks That Are IT Policy Friendly

With the much talked-about rise of the millennial population in the corporate landscape, expect the continued shift in enterprise communication and knowledge management applications to rapidly continue. In the same way that email replaced paper memos and pagers, IT policy friendly social networks will continue to grow, as seen with the launches and successes of Salesforce Chatter, Microsoft Yammer and Social Cast from VMWare.

**Anupriya Singh**  
**EX IV Year**

### Wireless power system



Wireless power or wireless energy transmission is the transmission of electrical energy from a power source to an electrical load without man-made conductors. Wireless transmission is useful in cases where interconnecting wires are inconvenient, hazardous, or impossible. The problem of wireless power transmission differs from that of wireless telecommunications, such as radio. In the latter, the proportion of energy received becomes critical only if it is too low for the signal to be distinguished from the background noise. With wireless power, efficiency is the more significant parameter. A large part of the energy sent out by the generating plant must arrive at the receiver or receivers to make the system economical. Other methods under consideration are electromagnetic radiation in the form of microwaves or lasers and electrical conduction through natural media. An electric current flowing

through a conductor, such as a wire, carries electrical energy. When an electric current passes through a circuit there is an electric field in the dielectric surrounding the conductor; magnetic field lines around the conductor and lines of electric force radially about the conductor.

In a direct current circuit, if the current is continuous, the fields are constant; there is a condition of stress in the space surrounding the conductor, which represents stored electric and magnetic energy, just as a compressed spring or a moving mass represents stored energy. In an alternating current circuit, the fields also alternate; that is, with every half wave of current and of voltage, the magnetic and the electric field start at the conductor and run outwards into space with the speed of light. Where these alternating fields impinge on another conductor a voltage and a current are induced. Any change in the electrical conditions of the circuit, whether internal or external involves a readjustment of the stored magnetic and electric field energy of the circuit, that is, a so-called transient. A transient is of the general character of a condenser discharge through an inductive circuit. The phenomenon of the condenser discharge through an inductive circuit therefore is of the greatest importance to the engineer, as the foremost cause of high-voltage and high-frequency troubles in electric circuits. Electromagnetic induction is proportional to the intensity of the current and voltage in the conductor which produces the fields and to the frequency. The higher the frequency the more intense the inductive effect. Energy is transferred from a conductor that produces the fields (the primary) to any conductor on which the fields impinge (the secondary). Part of the energy of the primary conductor passes inductively across space into secondary conductor and the energy decreases rapidly along the primary conductor. A high frequency current does not pass for long distances along a conductor but rapidly transfers its energy by induction to adjacent conductors. Higher

induction resulting from the higher frequency is the explanation of the apparent difference in the propagation of high frequency disturbances from the propagation of the low frequency power of alternating current systems. The higher the frequency the more preponderant become the inductive effects that transfer energy from circuit to circuit across space. The more rapidly the energy decreases and the current dies out along the circuit, the more local is the phenomenon. The flow of electric energy thus comprises phenomena inside the conductor and phenomena in the space outside the conductor—the electric field—which, in a continuous current circuit, is a condition of steady magnetic and dielectric stress, and in an alternating current circuit is alternating, that is, an electric wave launched by the conductor to become far-field electromagnetic radiation travelling through space with the speed of light.

In electric power transmission and distribution, the phenomena inside the conductor are of main importance, and the electric field of the conductor is usually observed only incidentally. Inversely, in the use of electric power for radio telecommunications it is only the electric and magnetic fields outside of the conductor, that is far-field electromagnetic radiation, which is of importance in transmitting the message. The phenomenon in the conductor, the current in the launching structure, is not used. The electric charge displacement in the conductor produces a magnetic field and resultant lines of electric force. The magnetic field is a maximum in the direction concentric, or approximately so, to the conductor. That is, a ferromagnetic body tends to set itself in a direction at right angles to the conductor. The electric field has a maximum in a direction radial, or approximately so, to the conductor. The electric field component tends in a direction radial to the

conductor and dielectric bodies may be attracted or repelled radially to the conductor.

The electric field of a circuit over which energy flows has three main axes at right angles with each other:

1. The magnetic field, concentric with the conductor.
2. The lines of electric force, radial to the conductor.
3. The power gradient, parallel to the conductor.

Where the electric circuit consists of several conductors, the electric fields of the conductors superimpose upon each other, and the resultant magnetic field lines and lines of electric force are not concentric and radial respectively, except approximately in the immediate neighbourhood of the conductor. Between parallel conductors they are conjugate of circles. Neither the power consumption in the conductor, nor the magnetic field, nor the electric field, are proportional to the flow of energy through the circuit. However, the product of the intensity of the magnetic field and the intensity of the electric field is proportional to the flow of energy or the power, and the power is therefore resolved into a product of the two components  $i$  and  $e$ , which are chosen proportional respectively to the intensity of the magnetic field and of the electric field. The component called the current is defined as that factor of the electric power which is proportional to the magnetic field, and the other component, called the voltage, is defined as that factor of the electric power which is proportional to the electric field. In radio telecommunications the electric field of the transmit antenna propagates through space as a radio wave and impinges upon the receive antenna where it is observed by its magnetic and electric effect.

**Nitesh Mishra**  
**EX IV Year**

# Steps Towards Success

**“There is nothing impossible to a willing heart”. *Alexander the Great***

Of all the goals people set in life, two stand out: success in our personal and professional lives. It turns out, these two are interdependent. Personal success supports and reinforces professional success. Professional success reinforces personal success. And together, they reinforce life’s most important pursuit — happiness.

Success in general means achieving an aim or attaining one’s goal. To some people success is living a comfortable and respectful life, some believe that success is a journey of hard work through endless efforts to achieve the desired goal, while others think having hefty amount of money is a real success. But for me **“success is living your dreams and fulfilling your desire.”** In the process of getting success one either achieves it or fails in his efforts. It is said by a great poet that **“the real taste of success can only be understood by a man who have tasted the defeat”**.

Sometimes success also depends on the fate but that’s not true in every case. Even if the fate is not favoring us we can lead towards success by putting extra efforts and doing hard word but fate without efforts leads us nowhere. One needs to put himself/herself into his/her goal whole heartedly. Success is also affected by the priorities in life; some want to grow professionally while the others satisfy themselves by holding the responsibility of family i.e. their personal life and some people want to get the higher rank in society. For all such people success means differently.

The main aim of article is to present the causes of failure and the steps for attaining success in one’s life and living the life to its fullest.



**“I never see what has been done; I only see what remains to be done”’. *Buddha***

We spend years in school learning about the lives of other successful people, but we devote hardly any time at all for studying ourselves. I believe that all of us are unique, have different potential and different qualities but all want to achieve their aim. I once heard that everyone is born unique but most of us die as copies. The major factor leading to failure is, not believing in ourselves and doubting our potential. I believe that we all have the capability to produce gold. We need to find and nurture our potentials to unlock the keys to achievement. We have to motivate ourselves to do what we must do to get on and go on with our lives as clear in Shiv Khera’s view that “The best idea will not work until we work upon that idea”. We have to pull our socks up and get out of discouraging situations. Life not always present us with an ideal situation in which we pursue our dreams. So in process of getting success we have to do the things that we have never done, to achieve the things that we have never got.!

**Rajvardhan Jain**  
**EX III Year**

## **SOLAR TUK TUK**



Naveen Rabelli, a Hyderabad electrical engineer who built his own solar auto, plans to drive down to the UK in it next year. He calls it the 'Solar Tuk Tuk'. A Hyderabad currently living in Bangalore, Naveen has "clocked 1,200 kilometres in and around Bangalore," and is pleased with the results of his tuk tuk. "Per charge, it is averaging 100 kilometres — 80 km electric and 20 km solar. One charge costs ₹40. Compare that to a regular diesel auto rickshaw which costs ₹250 worth of diesel," explains Naveen, throwing light on the effectiveness of the technology. "Not only is it much cheaper, it cuts down the emissions to almost zero," he quips. There, however, is one glitch. The auto weighs 700 kgs and can accommodate five passengers. "We are trying to bring down the weight of the solar panels to increase the range up to 120 km per charge. The solar batteries are very heavy and we are looking at devising ways of bringing down the weight and add more loading capacity," quips Naveen, who was in Hyderabad recently to engineer a data acquisition system at his dad's workshop. His dad is an Electronics Instrumentation engineer based in Tarnaka. "We never got along too well, but he was only too happy to help me build an automated system that displays temperature, voltage, etc. It sure did help break the ice," he says with a smile. Naveen hit upon the idea of an eco- friendly auto rickshaw in a local bar enroute Mysore Road. "I was going to attend a kite festival along with my friends and we were stuck in traffic. Instead we went and got a drink. Looking at the number of autos on the roads, we got talking about how much pollution could be reduced if we could make them eco-friendly," he shares. A couple of days later, he met global environmental adventurer Louis Palmer who travelled 50,000 km around the world in a solar-powered car he built. "Louis was invited for a company seminar. I was inspired by his story," adds Naveen, who quit his job and got working on his auto. Naveen admits to have "spent a little over ₹3 lakh" on the auto. A friend offered him a place to stay and set up his garage and he began working on it all by himself. "I taught myself automobile engineering, connected with local mechanics and fabricators Moula, Pasha and Santosh, who offered to work for free to help me build it. So a lot of people chipped in," says Naveen, who works as a part time badminton coach to make some extra money. This is a small excerpt of an interview by Naveen Rabelli which again throws a deep focus on the idea of using non- conventional source of energy (Solar energy) to built an eco-friendly vehicle. And which are undoubtedly a beneficial attempt to save our environment as well as the fast depleting conventional sources like coal diesel etc. In the 21st century, solar power has already become part of daily life. From solar heated swimming pools to sun powered homes, there are many examples that demonstrate the useful application of the clean, safe, sustainable power of the sun. As concern grows about the effects of burning fossil fuels, and the possibility of exhausting non-renewable energy sources, the future of solar energy looks bright. As of 2013, the technology is not without its problems, and so far, applications have mostly been relatively small scale, but a great deal of research is going on in this area, and there have been a number of very promising developments.

Poorvi Jain  
EX III Year

# SWARANJALI -2013



# Students Achievements:

2013-14					
S. No	Year	Name of student	Name of event	Award/Prize	Organizer
1	Jan 31-Feb3 2014	Sourabh Nandy Swapnil Sonkusare	Robotix	Participation	IIT Kharagpur
2	Oct 24-25, 2013	Rajat singh chandel	Taekwondo Championship	2 <sup>nd</sup> Prize	Inter College Taekwondo Championship, Nodal level, Indore
3	Dec28-30 2013	Rajat singh chandel	Taekwondo Championship	1 <sup>st</sup> Prize	Bengal Traditional Taekwondo association
4	Dec6-8 2013	Rajat singh chandel	Karate Championship	1 <sup>st</sup> Prize	South Asia Cup International Karate Championship Panaji(Goa)
5	2013	Kshitij Nagle	Volley ball	1 <sup>st</sup> Prize	Nodal level
6	Feb. 23, 2013	Parvez Khan	Hockey	2 <sup>nd</sup> Prize	Spardha'13 IIT, BHU
7	Oct 1- 10,2013	Parvez Khan	Hockey	2 <sup>nd</sup> Prize	State Hockey Tournament , Gwalior
8	Oct 20- 24,2013	Parvez Khan	Hockey	2 <sup>nd</sup> Prize	Major Dhyanchand Tournament, Nimuch

## **IEDC Sponsored Research Projects**

### **Unmanned Aerial Vehicle-QUADCOPTER**



Aditya Nagar

EX III Year