

VIDYUT

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Department of Electrical and Electronics Engineering
Official Newsletter



**GAS
INSULATED
SUBSTATION
(GIS)**

SKIN EFFECT vs FERRANTI EFFECT

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SRI VENKATESWARA COLLEGE OF ENGINEERING

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

Vision of the Institution

To be a leader in Higher Technical Education and Research by providing the state of the art facilities to transform the learners into global contributors and achievers.

Mission of the Institution

To develop SVCE as a "CENTRE OF EXCELLENCE" offering Engineering Education to men and women at undergraduate and postgraduate degree levels, bringing out their total personality, emphasizing ethical values and preparing them to meet the growing challenges of the industry and diverse societal needs of our nation.

Vision of the Department

The vision of Electrical and Electronics Engineering Department is to provide a high standard of education in Electrical and Electronics Engineering so as to meet the industry standards through domain.

Mission of the Department

M1: To create state of the art facilities such that the students excel in Electrical and Electronics Engineering education.

M2: To equip students with a well defined curriculum to meet the requirements of industries and society.

M3: To promote a culture of research, innovation and entrepreneurship in the thrust and allied areas of Electrical and Electronics Engineering.

M4: To inculcate soft skills and foster ethical values and shape the total personality of the students.

Program Educational Objectives (PEOs) UG-EEE

PEO1: Graduates of EEE transformed to engineering contributors in the fields of Electrical, Electronics and Computer Engineering.

PEO2: Succeed in becoming entrepreneurs through human centered design thinking and innovation.

PEO3: Become eligible to pursue higher studies in their chosen areas of engineering or management

PEO4: Effective, conscious and ethical team player in the field of green energy management and sustainability

Program Outcomes (POs) for UG-EEE

1. Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. Design/development of solutions: Design solutions for complex engineering problems and design system components processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
6. The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
7. Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and lead.
12. Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Program Specific Outcomes (PSOs) for UG-EEE

PSO1: The ability to build, implement, test and maintain analog and/or digital systems and implement Electronic control of Drives for Industrial automation and Electric Vehicle.

PSO2: The ability to analyze Power System network encompassing stability, control and protection and interconnection of Renewable Energy Sources with Micro and smart grid.

Program Outcomes (POs) for PG-PED

PO1: An ability to independently carry out research/investigation and development work to solve practical problems.

PO2: An ability to write and present a substantial technical report/document.

PO3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor program.

Program Specific Outcomes (PSOs) for PG-PED

PSO1: The ability to design and analyze Power Electronic converters and control of Electric drives for Industrial applications.

PSO2: The ability to apply Power Electronic Circuits in Transmission and distribution network of Power System and interconnection of Renewable Energy.

AN ARTICLE ON “ELECTRIFYING VEHICLES THROUGH SMART GRID”

Electric Vehicle (EV) is a future technology with numerous environmental advantages in various sectors. There are a large number of advantages in the adoption of EVs, but there are certain challenges for optimal placement of Charging Station.

The Smart Grid will have the infrastructure needed to enable the efficient use of this new generation of PEVs (Plug-in EVs). PEVs drastically reduce our dependence on oil, and they emit no air pollutants when running in all-electric mode. However, they do rely on power plants to charge their batteries, and conventional fossil-fueled power plants emit pollution. To run a PEV as cleanly as possible, it needs to be charged in the early hours of the morning, when power demand is at its lowest and when wind power is typically at its peak. Smart Grid technologies will help to meet this goal by interacting with the PEV to charge it at the most optimal time. But sophisticated software will assure that PEV is still fully charged and ready to go when required. One can still be able to demand an immediate recharge required.

In the future, PEVs may play an important part in balancing the energy on the grid by serving as distributed sources of stored energy, a concept called "vehicle to grid." By drawing on a multitude of batteries plugged into the Smart Grid throughout its service territory, a utility can potentially inject extra power into the grid during critical peak times, avoiding brownouts and rolling blackouts. PEVs also have the potential to help keep isolated parts of the grid operating during blackouts. They could also help integrate variable power sources into the grid, including wind and solar power. Financial incentives may be available for PEV owners that allow their batteries to be

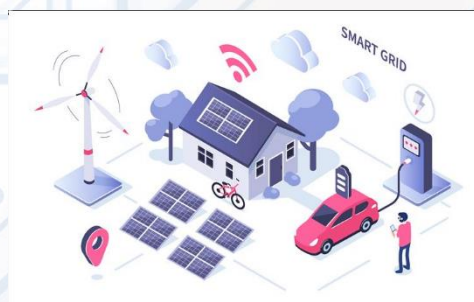
used this way, enabling a Charging Infrastructure for PEVs. One of the key factors for acceptance of PEVs in the marketplace will be the availability of charging stations.

Currently, a number of entities are building charging stations in cities throughout the United States, some of which are supported with DOE funding. For now, many municipalities and private companies are offering free recharges to PEV owners as an incentive for these cleanvehicles. However, as PEVs gain market penetration, this "free refueling"

is likely to come to an end, and charging station owners will be seeking a convenient way to charge PEV owners for their "fill-ups."

Advantages of Smart Grid technologies

- ✚ Potential solution by the energy provider to the PEV owner.
- ✚ With the Smart Grid, PEVs can identify themselves to the charging station when they are plugged in, and the electricity used can be automatically billed to the owner's account.
- ✚ Smart grid technology will not only simplify transactions for the charging station owners, but also allow PEV owners to charge up without the need for cash or a credit card.
- ✚ Reuse of the existing power grids and infrastructure Enhanced mobility in city areas
- ✚ Emission-free operation



PONGAL CELEBRATIONS AT SVCE

Pongal festival was celebrated in a grand manner, under the aegis of the Women Empowerment Cell, lead by Dr.KR Santha, Vice principal, Chair person, WEC, SVCE at Vijaya Ganapathy temple at the college premises on 12.01.2023 from 10.30 AM to 11.30 AM . Staff and students of all departments participated in the celebration.



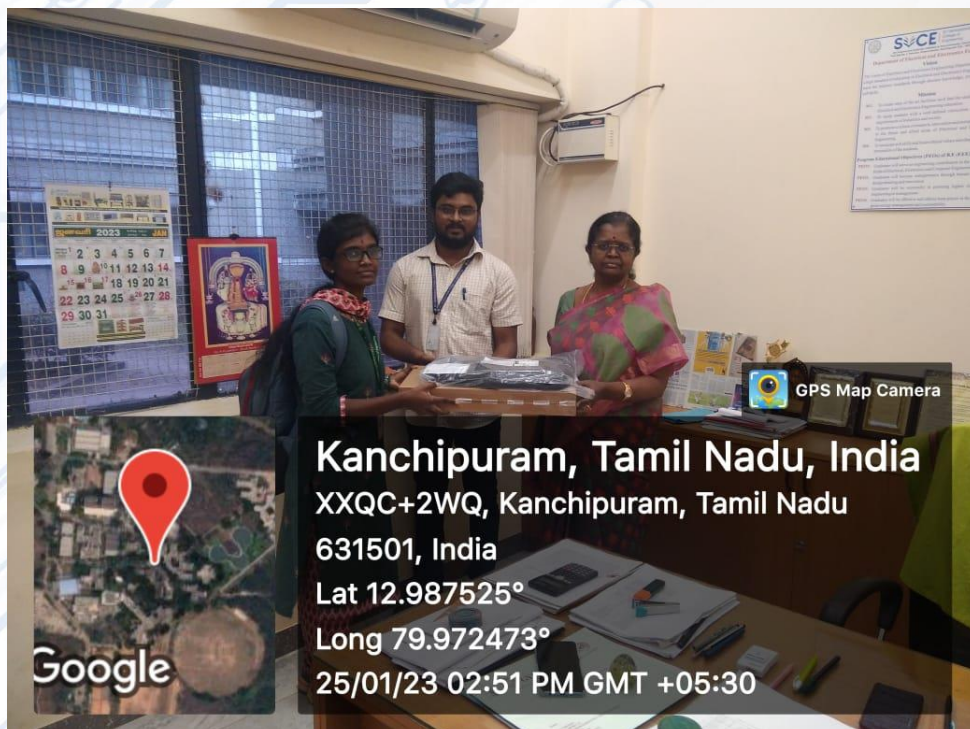
LAPTOP SCHEME 2022-23

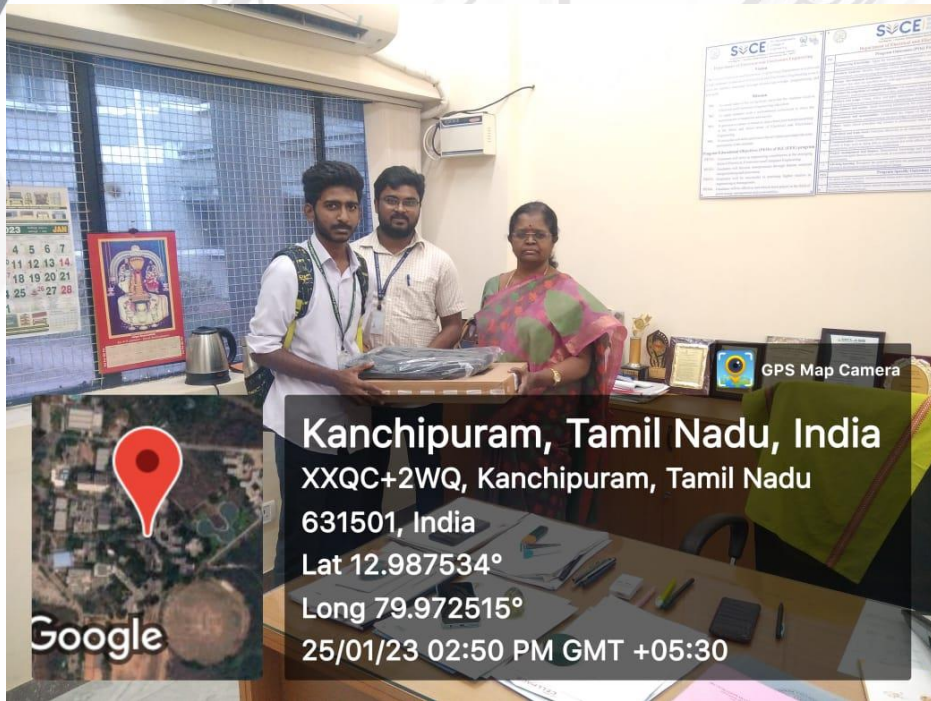
SVCE management provides an opportunity to the staff and students to buy laptops on installment basis. For every academic year, students who want to avail the Laptop scheme shall apply and purchase laptop on installment basis at subsidized rates.

List of students for this academic year receiving laptop under this scheme are

1. Mohamed Nowful.A (21217210601036)
2. Shakthivel S (21217210601055)
3. Srianga Abhiram G (21217210601066)
4. Tharun Balaji G (2121210601071)

Below are pictures of students of second year EEE (2021-24) batch receiving laptop from Dr. KR. Santha, Professor & Head, EEE on 25th January, 2023.





Kanchipuram, Tamil Nadu, India
XXQC+2WQ, Kanchipuram, Tamil Nadu
631501, India
Lat 12.987534°
Long 79.972515°
25/01/23 02:50 PM GMT +05:30



Kanchipuram, Tamil Nadu, India
XXQC+2WQ, Kanchipuram, Tamil Nadu
631501, India
Lat 12.987534°
Long 79.972486°
25/01/23 02:49 PM GMT +05:30

PLACEMENT AND INTERNSHIP DETAILS

List of our IV year students placed in the core and software companies

Core Offers

1. Mr. Gowrishankar S placed in Saint-Gobian India Pvt Ltd.



Mr. Gowrishankar

2. Mr. Prasath Raj K and Ms. Deepika JB are placed in VOLTAS Limited - A TATA Enterprises



Ms. Deepika JB

3. Mr. Venkatesh B, Mr. Kailashkumar B and Mr. Imranbasha K are placed in JN Machinerics Pvt Ltd.



Mr. Venkatesh B



Mr Kailashkumar B

Software Offer

1. Mr. Sathish G placed in Hibiz solutions Pvt Ltd.



Mr. Sathish G

Internship Details

1. Mr. B.Venkatesh is undergoing internship at Joy Technologies Pvt Ltd



Mr. Venkatesh B

2. Mr. Arjun Srinath J ,Ms. R.Bhuvaneshwari, Mr. Karthik T, Mr.Lohinath K, and Mr.Lathishkumar K.M got internship offer for six month duration from CTS



Mr. Arjun Srinath



Ms. R.Bhuvaneshwari



Mr. Karthik T



Mr.Lohinath K



Mr. Lathishkumar K.M

FACULTYS PARTICIPATION IN FDPs/WORKSHOPS

- ❖ **Ms. S. Arulmozhi, Ms. K. Suganthi, Ms. M. Sasikala, Mr. M. Ranjithkumar, Mr. D.S. Purushothaman, Ms.K.S. Pavithra and Ms.S. Sinthamani** completed 6 days workshop on “Research Innovations and Emerging Advances in Electrical Engineering” organized by Department of Electrical & Electronics Engineering, Easwari Engineering College, held from 5th to 12th January , 2023.
- ❖ **Dr. Sudhakar K B, Dr. S. G. Bharathidasan, Dr. S. Kumaravel, Dr. S. Sethuraman, Dr. T. Annamalai, and Ms. S. Arulmozhi** completed 3 days FDP on “The Art of Living” -Faculty development Program, at Sri Venkateswara College of Engineering from 9th to 11th January 2023.
- ❖ **Mr.I.Arun Abhishek , Dr.R.Kannadasan and Mr. M. Baradwaj** attended one day workshop on “IPR & Patents and Design Filing”, at Sri Venkateswara College of Engineering held on 30th January 2023.
- ❖ **Mr. M. Baradwaj** has attended the Guest lecture by AICTE Chairman Prof. Sitaram on “Leadership skills”, organized by Sri Venkateswara College of Engineering on 30th Jan 2023.
- ❖ **Dr.K.R.Santha, Dr.Sudhakar K B, Dr.N.K.Mohanty, Dr.C. Gopinath, Ms. S. Arulmozhi and Ms. M.Sasikala** attended two days AICTE Sponsored Workshop on " Gender Audits in Higher Education Institutions: The Why and How?" at Sri Venkateswara College of Engineering held on 27th and 28th January 2023.

EVENTS CONDUCTED BY PROFESSIONAL SOCIETIES

IPR Workshop

Institution Innovation Council (IIC-SVCE) of Sri Venkateswara College of Engineering in association with Rajiv Gandhi National Institute of Intellectual Property Management (RGNIIPM) Government of India, Nagpur organized Free Online Workshop on “Intellectual Property Rights (IPR) & Patents and Design filing”. (Under National Intellectual Property Awareness Mission) on 30th January, 2023 at 11 am.

- Invited Speaker was Dr. Pankaj P Borkar. Dy. Controller of Patents and Design, IPO Mumbai/RGNIIPM, Nagpur

The objective of the workshop was to create awareness about IPR & Patent and Design among students and faculty.



Leadership Talk

The IIC-SVCE organized a Guest lecture by AICTE Chairman Prof. Sitaram on "Leadership skills", 30th Jan 2023. It was attended by more than 150 students from all the departments.



YRC -Mega awareness program

YRC SVCE Unit organized a five-day mega awareness program during 26th -31st January, 2023 where the students had the opportunity for live interactions and discussions on various important topics viz. First aid training program, Republic Day competitions, Road safety awareness program, National youth day celebrations and Yoga training & awareness program. Several competitions were conducted during the mega awareness program and the winners were felicitated by the chief guest and juries. YRC SVCE Unit, Through Humanity to Peace, certainly did train the students on social responsibility, health, life, and moral capacities.

Ethnic day

Ethnic day is a day of celebration for the diversity of cultures and ethnicities. It enables the young generation to revive love and respect for their own culture and history. This year Ethnic day was celebrated on 21st January, 2023, for our final year students. Events were organized for the students and coordinated by student council.



SKIN EFFECT vs FERRANTI EFFECT

The "skin effect" and the "Ferranti effect" are two related but distinct electrical phenomena that occur in high-frequency alternating current (AC) electrical systems.

The skin effect refers to the tendency of high-frequency AC currents to concentrate near the surface of a conductor. This is because high-frequency currents generate stronger electromagnetic fields than low-frequency currents, and these fields interact with the electrical conductors in a way that tends to push current towards the surface. As a result, the effective resistance of the conductor increases with frequency, leading to a reduction in the amount of current that flows through the core of the conductor.

The Ferranti effect refers to the tendency of the voltage at the end of a long electrical transmission line to be higher than the voltage at the beginning of the line. This is due to the skin effect, which causes the current in the core of the conductor to be reduced, and the voltage drop along the line to be concentrated near the surface of the conductor. The Ferranti effect can lead to an increase in the transmission losses in long electrical transmission lines, and it can also cause stability problems in power systems.

Some facts about Lightning

Studying atmospheric phenomena: Scientists study lightning to learn more about the composition of the Earth's atmosphere and the behavior of electrically charged particles in the atmosphere.

Providing natural light: Lightning can provide natural light for brief periods of time, which can be useful for photographers and filmmakers who want to capture the beauty of a thunderstorm.

Detecting earthquakes: Lightning can be used to detect earthquakes, as the intense electromagnetic fields generated by lightning can interact with the Earth's magnetic field and create seismic waves.

Power generation: Some researchers are exploring the use of lightning as a source of renewable energy, as lightning has the potential to produce large amounts of electrical power.

While lightning has some practical uses, it is also a dangerous force that can cause significant damage to property and harm people, so it is important to use caution when working with or near lightning.

DID YOU KNOW???????

There are **several ways to overcome** or minimize the effects of the skin effect and the Ferranti effect:

Increasing conductor size: One of the most effective ways to reduce the skin effect is to increase the size of the conductor. This allows more current to flow through the core of the conductor, reducing the concentration of current near the surface.

Using Litz wire: Litz wire is a type of conductor made up of many small individual wires that are twisted or woven together. The individual wires are insulated from each other, which helps to reduce the skin effect by distributing the current more evenly throughout the conductor.

Using multi-conductor transmission lines: Another approach is to use multiple conductors in parallel to +transmit the same electrical power. This helps to reduce the skin effect by distributing the current more evenly throughout the conductors, and it also helps to reduce the Ferranti effect by reducing the voltage drop along the transmission line.

Increasing the frequency of the AC current: By increasing the frequency of the AC current, the skin effect can be reduced, as the current is able to penetrate more deeply into the conductor.

Using high-permittivity materials: High-permittivity materials, such as ceramic materials, can be used to surround the conductor. These materials help to reduce the skin effect by reducing the magnetic field that concentrates current near the surface of the conductor.

A **lightning arrester**, also known as a lightning protector, is a device designed to protect electrical equipment and structures from the damaging effects of lightning strikes. Lightning arrestors are typically installed in buildings, power transmission systems, and other structures to protect against lightning surges, which can cause significant damage to electrical equipment and structures.

Lightning arrestors work by providing a path of least resistance for the lightning surge, allowing it to safely flow to ground instead of flowing through the electrical equipment and causing damage. This is achieved by using a high-voltage spark gap or a metal oxide varistor (MOV), which provides a low-impedance path for the lightning surge to follow.

There are different types of lightning arrestors, including surge diverters, shunt-mode spark gaps, series-mode spark gaps, and transient voltage suppressors (TVS). The choice of the best type of lightning arrester depends on the specific requirements of the electrical system and the type of equipment that is being protected.

It's important to note that lightning arrestors are not a guarantee against lightning damage, as lightning can still cause damage even if a lightning arrester is installed. However, lightning arrestors can significantly reduce the risk of damage from lightning and help to protect valuable electrical equipment and structures.

Fun Fact

Did you know that lightning is one of the most powerful natural sources of electricity on the planet? It's estimated that the average lightning bolt carries an electrical charge of around 100 million volts and can reach temperatures as hot as 50,000 degrees Fahrenheit, which is five times hotter than the surface of the sun! When lightning strikes the ground, it can create powerful electromagnetic fields that can induce electric currents in metal objects, like pipes, wires, and fences. This is why it's important to avoid touching metal objects during a lightning storm.

DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING

NEWSLETTER

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Dr. Sudhakar K Bharatan, AHOD

Dr. R. Karthikeyan, Associate Professor

Ms. S. Sinthamani, Assistant Professor

Mr. S. Bharadwaj, Assistant Professor

Mr. Sabari & Ms. N. Harini, III year