GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
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Madhurawada , Visakhapatnam. 530048.

Vidyut-2k21

Issue-5

If u want to find the secrets of universe
think in terms of energy frequency and vibration

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PRINCIPAL'S MESSAGE

As the Principal of GVPCEW I am honoured to share my thoughts with you through this electrical department magazine 2K21. In today's rapidly changing and technologically advanced world, the importance of science and technology has never been greater and in this institution, we are committed to provide our students with a high-quality education that prepare them for careers in the field of technology. Our faculty members are dedicated in fostering a culture of innovation and collaboration, and to equip our students with the knowledge and skills those are required to succeed in the outside world.

Electrical department has undertaken various innovative projects be it conversion of Petrol vehicle to Hybrid vehicle or solar charging tree etc. and I am confident that with the hard work and dedication, the department will continue to lead the way in shaping the future of electrical engineering students.

I would like to extend my sincere appreciation to the editorial team for making this magazine a reality.

HOD'S MESSAGE

The G.V.P. College of Engineering for Women is facilitating such a nice platform to the students of all branches to prove themselves and enrich their knowledge. Hope that each participant will enjoy the academic flavors of all programs and gain high confidence levels. I wish the program to be a grand success.

Editorial

Educational institutions are the " temples of learning ".in the parlance of great thinkers. It is institutions that create individual values as contributing citizens of India.

The profession of Engineering is old as human life is yet to be synchronized globally thereby giving deserved respectability to the engineer. It is in this direction much work needs to be done through continuous productive interactions between institutions, industrial associations, and global regulatory bodies.

It is interesting to learn about the institution's services rendered in shaping the lives of youngsters who arrive as raw individuals at the portals of this institution. Deep-rooted conviction of management combined with dedicated faculty has made us stand out as an institution of reckoning for the past 10 years. Our best wishes to every member of the team for making expressions become the much-awaited magazine of the Indian fraternity.

We are happy to bring out the issue of "VIDYUT" for the year 2021. In this issue, the faculty article is on **"ROBUST STABILITY CONSTRAINTS FOR OPTIMAL LEAD LAG PSS DESIGN USING INTERVAL APPROACH"**, by Ms. A.S.V Vijaya Lakshmi who has explained about the transformer less grid-connected photovoltaic multilevel inverter for realizing individual maximum power point of each module. There is a student article on **"LIFE CYCLE ASSESMENT"**. The article has described the concepts relating to the process and applications of LCA (life cycle assessment) in our daily life. There is a student project paper on **"ELECTRICAL VEHICLE CHARGING STATION USING SOLAR TREE".** This paper explains how you can charge the electrical equipment using the solar panels.This is followed by the regular sections of Technology Review; Know a Scientist, Short Story, and Puzzles, Arts. This issue also contains the contributions and achievements of the students of the department during the year. We are thankful to the entire department for their continuous support in bringing this issue successfully.

Vision

To develop into a centre of learning that empowers students with contemporary knowledge in Electrical and Electronics Engineering.

Mission

- Impart skills both in traditional and modern areas of Electrical & Electronics Engineering
- Provide exposure to the latest developments in the field through seminars, industrial visits, workshops, and paper presentations.
- Prepare the young minds to apply professional engineering practices by considering environmental and societal needs.

Program Educational Objectives

After successful completion of the program, the graduates will be able to:

PEO-1: Possess a strong educational foundation in mathematics, science, electrical engineering, and soft skills in the diversified sectors of the industry.

PEO-2: Exhibit critical thinking, problem-solving skills, and design systems in professional engineering practice.

PEO-3: Establish leading and supportive positions in society by adopting lifelong learning skills with a commitment to their ethical and social responsibilities.

Program-Specific Outcomes

Engineering Graduates will be able to:

PSO-1: Design and analyse systems that efficiently generate, transmit, distribute and utilize electrical power.

PSO-2: Demonstrate proficiency in the use of hardware and software tools for solving complex engineering problems in renewable energy and other emerging areas.

Know a Scientist

***André-Marie Ampère** was a French physicist and mathematician. He was born on 20 January 1775, in Lyon, the kingdom of France. The French Revolution (1789–99) that began during his youth was also influential. In 1796, Ampère met Julie Carron, and in 1799 they were married. Ampère took his first regular job in 1799 as a mathematics teacher. In 1802, Ampère was appointed a professor of physics and chemistry at the École Centrale in Bourg-en-Bresse.*

***Career and Contributions**:*

He was one of the founders of the science of classical electromagnetism, which he referred to as "electrodynamics". He is also the inventor of numerous applications, such as the solenoid (a term coined by him) and the electrical telegraph. As an autodidact, Ampère was a member of the French Academy of Sciences

*In 1828, 1819 and 1820 Ampère offered courses in philosophy and astronomy, respectively, at the University of Paris, and in 1824 he was elected to the prestigious chair in experimental physics at the Collège de France Ampère began developing a mathematical and physical theory to understand the relationship between electricity and magnetism. Ampère showed that two parallel wires carrying electric currents attract or repel each other, depending on whether the currents flow in the same or opposite directions, respectively - this laid the foundation of electrodynamics. It then became Ampere's law: **which states that the mutual action of two lengths of current-carrying wire is proportional to their lengths and to the intensities of their currents.***

Ampère also provided a physical understanding of the electromagnetic relationship, theorizing the existence of an "electrodynamic molecule" that served as the component element of both electricity and magnetism.

Awards and Honours:

The Prix Ampère de l'Electricite de France is a scientific prize awarded annually by the French Academy of Sciences. Founded in 1974 in honor of Ampère to celebrate his 200th birthday in 1975, the award is granted to one or more French scientists for outstanding research work in mathematics or physics. The award is 30,500 euros, funded by Électricité de France.

An international convention, signed at the 1881 International Exposition of Electricity, established the ampere as one of the standard units of electrical measurement, in recognition of his contribution to the creation of modern electrical science and along with the coulomb, volt, ohm, watt and farad, which are named, respectively, after Ampère's contemporaries Charles-Augustin de Coulomb of France, Alessandro Volta of Italy, Georg Ohm of Germany, James Watt of Scotland and Michael Faraday of England. Ampère's name is one of the 72 names inscribed on the Eiffel Tower.

In 1827, Ampère was elected a Foreign Member of the Royal Society and in 1828, a foreign member of the Royal Swedish Academy of Science.[9] Probably the highest recognition came, as a reward for his mathematical representations in his publication, 'Memoir on the Mathematical Theory of electrodynamic phenomena deduced solely from experiment,' for which Ampère was awarded the title of the "Newton of electricity".[citation needed]Several items are named after Ampère; many streets and squares, schools, a Lyon metro station, a graphics processing unit microarchitecture, a mountain on the moon, and an electric ferry in Norway.

Faculty Article

Robust Stability Constraints for optimal Lead Lag PSS design using Interval approach

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EEE Department, GVPCEW

ABSTRACT

Electric vehicles have become much more common in our daily lives as a result of technological advancements. This may cause tremendous growth in the consumption of electrical energy. The globe is moving toward the alternative energy generation as a result of global warming and the depletion of fossil resources. Hence ingress of renewable energy into the power sector is inevitable resulting in unavoidable power system uncertainty. Consequently, synchronous generators must function in a wide range of unpredictably changing operational conditions. Hence, tuning of Power System Stabilizer (PSS) parameters over a wide range is required. This research provides a new way for constructing a lead-lag PSS that can effectively stabilize the system under wide operational scenarios. The PSS parameters are tuned using the simple stability conditions proposed to ensure power system stability, and the interval coefficients quantify the uncertainty in the system parameters under practical situations. To improve the proposed lead-lag PSS's performance, an objective function is defined. The Jaya algorithm is used to fine-tune the PSS parameters. The robustness of the proposed PSS design is confirmed by a case study of a single machine infinite bus (SMIB) power system. Simulation results reveal that the suggested lead-lag PSS is more successful than other well-known controllers in the literature when the system is induced with a step load disturbance for a wide set of operational states.

Keywords: Uncertainty, SMIB, Interval system, lead lag PSS, Jaya algorithm

1. INTRODUCTION

Power engineers are concerned with the mitigation of Low Frequency Oscillations (LFO) in a huge power system network. Because, the weak damping effect of the oscillations restrict the tie-line power flows and can even induce blackouts. The net damping effect is improved by adding an auxiliary device to the field system, such as a PSS [1]. The change in speed, accelerating power [2], or a combination of these two can be used as the stabilizer's input, while the stabilizer's output is the voltage provided to the field system. Demello [3] provides a framework for designing PSS for many the existing approaches. On the other hand, classical PSS design is for a specific operating condition, therefore change in the operating state can lead to poor PSS performance and even system instability. As a result of the varying system conditions, tuning the PSS parameters over a wide range is required to performance and even system instability. As a result of the varying system conditions, tuning the PSS parameters over a wide range is required to assure power system stability. Furthermore, the design techniques must result in acceptable PSS performance for different operational conditions. However there exist many methodologies to tune the PSS parameters using linear control approaches such as linear quadratic regulator [4], pole placement [5], sliding mode control [6], linear matrix inequalities [7], quantitative feedback theory [8], H_2 or H_∞ [9] framework and non-linear methods like adaptive control [10], self-tuning [11] and heuristic dynamic programming [12] methods. Also, artificial intelligence and optimization techniques were used to determine the PSS settings for wide range of operational scenarios.

However, several of the suggested solutions require a large amount of system variable data or extensive eigen value analysis. In addition, to deal with large load variation, the system has a separate controller for each loading state, such as heavy, nominal, or light to provide proper dynamic stability. As a result of this, the system's costs may rise. Artificial Intelligence approaches like fuzzy logic and neural networks provide promising results for nonlinear power system stability. But the drawback of these methods includes the complexity of training for ANN and the need for extensive system knowledge for Fuzzy logic. However, system uncertainties can be dealt with adaptive and robust control techniques. In the adaptive method, system conditions are determined online and tune the controller parameters. But PSS settings may be improperly tuned due to time delays in the PSS, presence of noise, and loss of input data. However, in robust control, all possible practical operating conditions are considered offline and design a fixed controller hence, favorable in implementing for practical power systems. But, a robust control method like H∞ attains a controller of higher-order and LMI technique needs to find the weight functions.

Although interval systems absorb all system uncertainties and store them in transfer function coefficients, this method has received little attention in the power systems community. However, the present PSS design methodologies that use interval systems employ Kharitonov theorem. But, according to it, the interval coefficients should be independent of each other hence, results may be conservative. On the other hand, stability of interval system employing PSO, tune the poles of eight kharitonov polynomials necessitates a significant amount of calculation. To overcome the limitations and shortcomings of existing methodologies simplified inequality stability constraints are derived directly from interval polynomial without the requirement to formulate the Kharitonov polynomials in this research study. The Jaya optimization algorithm is employed to fine-tune the PSS parameters while meeting the inequality stability constraints and reducing the stated objective function

2. PROBLEM FORMULATION

For small signal stability, the system dynamics can be given by the equations that are linearized around the operational state, and Figure (1) shows the block diagram of linearized equations known as the Heffron-Pilliphs model [3]. With the exception of k_3, all of the model parameters from k_1 to k_6 depend on load, Manson's rule can be used to compute the plant's transfer function G(s) without the controller and it is given as:

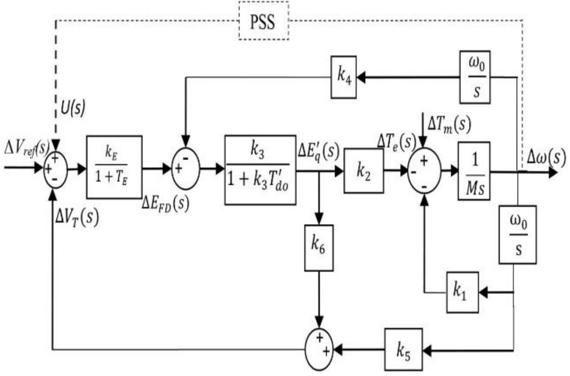


Figure 1: SMIB power system linearized model

$$G(s) = \frac{\Delta\omega(s)}{\Delta V_{ref}(s)} = \frac{-bs}{a_4s^4 + a_3s^3 + a_2s^2 + a_1s + a_0} \qquad (1)$$

The transfer function coefficients are:

$a_4 = MTTE_E; \quad a_3 = M(T + T_E);$

$a_2 = M + 314K_1TT_E + K_gk_3K_6M;$

$a_1 = 314K_1(T + T_E)$-$314K_2K_3K_4T_E;$

$a_0 = 314(K_1 - K_2K_3K_4 - K_EK_2K_3K_5 + K_EK_1K_3K_6)$

b=$K_gK_2K_3$ (2)

Where $T = k_3T'_{do}$

The field time constant, machine inertia constant, exciter time constant, and machine loading all influence the transfer function coefficients. As a result, as the system load changes over time, so do the transfer function coefficients. The coefficient upper and lower limits can be calculated by changing the loading condition throughout a specific range, i.e. $P \epsilon [P_L , P_H]$ and $Q \epsilon [Q_L , Q_H]$. Then the following polynomial in interval form can be used to approximate the transfer function.

$$G(s) = \frac{N(s,b)}{D(s,a)} = \frac{-[b^-, b^+]s}{[a_4^-, a_4^+]s^4 + [a_3^-, a_3^+]s^3 + [a_2^-, a_2^+]s^2 + [a_1^-, a_1^+]s + [a_0^-, a_0^+]} \qquad (3)$$

$$where\ a_i^- = (_P, Q^{min}(a_i)\ ;$$

$$a_i^+ = (_P, Q^{max}(a_i)\ ;$$

$$b^- = (_P, Q^{min}(b); \quad b^+, Q\text{^}max)(b)$$

for i=1,2,3,4.

The open loop system is unstable at particular operational points. As a result, a controller must be developed to keep the system stable under all operating conditions. This research work presents how to construct a fixed parameter robust Lead Lag PSS, as the operational state varies over a specific bound, such as $P \epsilon [P_L , P_H]$ and $Q \epsilon [Q_L, Q_H]$. The fixed polynomial stability conditions given by Nie and Xie [17] are used to develop the new simple stability conditions. The robust controller parameters are then designed for a specific bound of operational states for the SMIB system using the newly developed necessary and sufficient conditions.

3. DEVELOPMENT OF NEW STABILITY CONSTRAINTS

Consider a real polynomial of n^{th} order in interval form:

$$P(s,p) = p_n s^n + p_{n-1} s^{n-1} + - - + p_1 s + p_0 \quad (4)$$

where the coefficient p_j defined in terms of system parameters is always within the lower and higher limits as the variables changes due to system uncertainties as:

$$p_j = [p_j^-, p_j^+] \; for \;\; j = 1,2,3 \ldots \ldots n.$$

The polynomial degree is considered to be constant throughout the interval family and referred as an interval polynomial. If the family of polynomials given by Equation (4) is Hurwitz then the interval polynomial is said to be stable. The new stability constraints for this interval polynomial (4) are constructed using the simple stability conditions of a fixed polynomial developed by Nie and Xie **.** They are as follows:

3.1 Lemma 1: The polynomial *P(s, p)* in interval form as given in equation (4) is Hurwitz for all $p_j \in [p_j^- p_j^+] \; where \; j = 0,1,2,3 \ldots . n$ if and only if they satisfy the following necessary conditions.

$$p_j > 0 \; and \; p_j p_{j+1} > p_{j-1} p_{j+2} \quad (5)$$

The above necessary conditions are further simplified into fixed coefficients as follows:

$$\left.\begin{array}{ll} p_j^+ \geq p_j^{\to 0} & for \; j = 0,1,2,3 \ldots n \\ p_j^- p_{j+1}^{\to p_{j-1}^+ p_{j+2}^+} & for \; j = 1,2,3 \ldots n-2 \end{array}\right\} \quad (6)$$

3.2 Lemma 2: The polynomial *P(s, p)* in interval form as given in equation (4) is Hurwitz for all

$$p_j \in [p_j^- p_j^+] \; where \; j = 0,1,2,3 \ldots . n$$

if and only if they satisfy the following sufficient conditions.

$$p_j > 0 \; and \; 0.4655 p_j p_{j+1} > p_{j-1} p_{j+2} \quad (7)$$

The above sufficient conditions in interval form are further simplified into the fixed coefficients as follows:

$$\left.\begin{array}{ll} p_j^+ \geq p_j^{\to 0} & for \; j = 0,1,2,3 \ldots n \\ 0.4655 p_j^- p_{j+1}^{\to p_{j-1}^+ p_{j+2}^+} & for \; j = 1,2, \ldots n-2 \end{array}\right\} \quad (8)$$

Hence, the robust stability conditions for a fifth order SMIB power system are as follows:

$$\left.\begin{array}{c} p_0^+ \geq p_0^{\to 0}; p_1^+ \geq p_1^{\to 0}; p_2^+ \geq p_2^{\to 0}; p_3^+ \geq p_3^{\to 0}; \\ p_4^+ \geq p_4^{\to 0} and \; p_5^+ \geq p_5^{\to 0} \\ \frac{p_0^+ p_3^+}{p_1^- p_2^-} < 0.4655; \frac{p_1^+ p_4^+}{p_2^- p_3^-} < 0.4655 \; and \; \frac{p_2^+ p_5^+}{p_3^- p_4^-} < 0.4655 \end{array}\right\} (9)$$

The newly obtained necessary and sufficient stability conditions, given by Equation (9) are applied to design an optimal Lead Lag PSS for a wide operating SMIB power system.

4. DESIGNING A LEAD LAG PSS FOR A WIDE OPERATING SMIB POWER SYSTEM

As a case study the SMIB power system is taken with the machine data from. Over the following ranges, the active power (P) and reactive power (Q) are considered to alter independently. i.e., $P \in [0.4, 1.0]$ and $Q \in [-0.1, 0.5]$, with the desired step size to get 1024 operational states. This includes almost all commonly seen operating circumstances. The interval coefficients are obtained from minimum and maximum values of each coefficient and are given

$$\left.\begin{array}{c} a_4 = [1,1]; a_3 = [22,22]; a_2 = [80,106]; \\ a_1 = [574,996]; a_0 = [1030,2550]; b = [4.6,11.55] \end{array}\right\} \; (10)$$

The plant's open-loop interval transfer function is determined by substituting Equation (10) into Equation (3) as follows:

$$G(s) = \frac{[-4.6, -11.55]s}{[1,1]s^4 + [22,22]s^3 + [80,106]s^2 + [574,996]s + [1030,2550]} \quad (11)$$

The minimum damping ratio (ζmin) is computed for 1024 operational states to demonstrate the open-loop system's damping characteristics and it is presented in Figure (2).

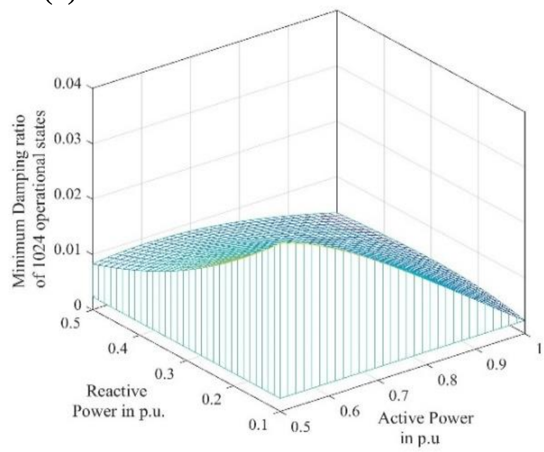


Figure 2: The open loop system minimum damping ratio of 1024 operational states

ζ_{min} is very low for certain operational states illustrating the weak dampening, causing the system to unstable in the face of uncertainty. To robustly stabilize the system for 1024 operational states a lead lag PSS as given by Equation (12) is considered in this research study.

$$G_c(s) = K \frac{(1 + sT_1)}{(1 + sT_2)} \quad (12)$$

Where K is the controller gain and T_1,T_2 are the time constants. However, from [3], T_2 is taken as 0.05 to give satisfactory dynamic response. Consequently, the following equation gives the plant's closed-loop transfer function:

$$T(s) = \frac{[-4.6,-11.55]*(1+0.05s)*s}{[1,1]*0.05*s^5+([22,22]*0.05+[1,1])s^4+([80,106]*0.05+[22,22])s^3+([574,996]*0.05+([80,106]+[4.6,11.55]*K*T_1)s^2+([1030,2550]*0.05+[574,996]+[4.6,11.55]K)s+[1030,2550]} \quad (13)$$

$$D(s,a) = [0.05,0.05]s^5+[2.1,2.1]s^4+[26,27.3]s^3 + [108.7+4.6*K*T_1\ ,155.8+11.55*K*T_1]s^2 + [625.5+4.6*K\ ,1123.5+11.55*K]s+[1030,2550] \quad (14)$$

The closed-loop transfer function characteristic equation is obtained from above as follows:

Apply the new stability conditions from Equations (9) to Equation (14), the inequality constraints are determined as follows:

$$Constraint\ 1: \frac{(2550)*(27.3)}{[(625.5+4.6*K)*(108.7+4.6*K*T_1)]} - 0.4655 < 0 \quad (15)$$

$$Constraint\ 2: \frac{[1123.5+11.55*K]*2.1}{[108.7+4.6*K*T_1]*26} - 0.4655 < 0 \quad (16)$$

$$Constraint\ 3: \frac{[155.8+11.55*K*T_1]*0.05}{26*2.1} - 0.4655 < 0 \quad (17)$$

$$Constraint\ 4: -625.5-4.6*K < 0 \quad (18)$$

$$Constraint\ 5: -108.7-4.6*K*T_1 < 0 \quad (19)$$

The parameters of the lead lag PSS are minimized using the below objective function as:

$$J_{min} = abs(K) + abs(T_1) \quad (20)$$

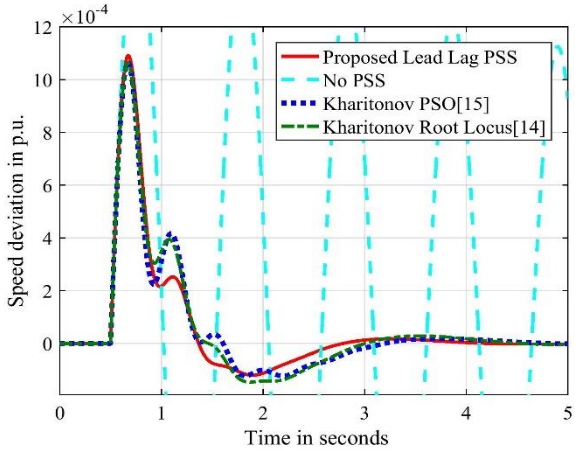
The optimum parameters are found by minimizing Equation (20) while meeting the set of inequality constraints defined by equations (15)-(19). To compute the parameters of lead lag PSS, the proposed algorithm is constructed in MATLAB and uses the Jaya optimization technique. The following are the PSS parameters:

$$K = 5.3164, and\ T_1 = 4.9624 \quad (21)$$

5. JAYA OPTIMIZATION TECHNIQUE

Design variables are more prevalent in real time design challenges and settings. Furthermore, the impact of them to achieve the target is substantial and the program developer demands for global minima, even though the objective function may stick in local minima**.** Hence conventional approaches are inefficient for tackling such issues since they only compute local optima. As a result, an intelligent strategy is necessary for efficiently handling limited design problems. In this research work Jaya Optimization algorithm is employed since it is free of algorithm specific parameters and reduces the computational efforts. Constraints handling was done by adopting penalty method. The flow chart shown in Figure (3) presents the algorithm steps to attain the optimal solution.

Figure 3: Jaya Algorithm Flow Chart



6. SIMULATION RESULTS AND DISCUSSIONS

For heavy, nominal and light operating states, the system is simulated using the Heffron-Philiphs model as given by Figure (1) in MATLAB-SIMULINK. The efficiency of the proposed methodology is evaluated for each of the three scenarios by subjecting the system to 10% mechanical step disruptions. Figures (4), (5), and (6) depict the plant's speed deviation responses, respectively. The addition of PSS to the machine improves its dynamic stability.

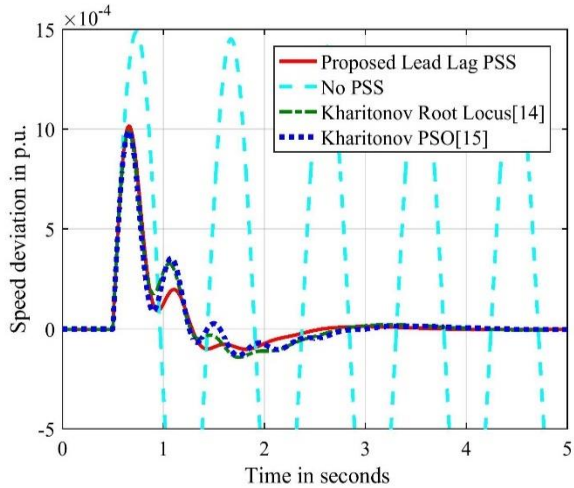


Figure 4: Speed deviation response at heavy load for 10% step mechanical disturbance

Figure 5: Speed deviation response at nominal load for 10% step mechanical disturbance

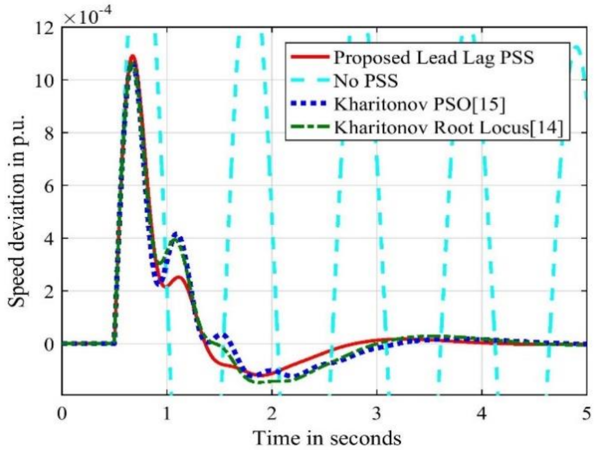


Figure 6: Speed deviation response at light load for 10% step mechanical disturbance

The proposed lead lag PSS has a shorter settling time than the other prominent controllers in the literature even though peak values more or less same. Therefore, under various loading situations the proposed Lead Lag PSS effectively dampens system oscillation for the provided disturbance. Therefore, under all operational situations, the proposed method outperforms the other controllers in terms of dynamic performance for the system's uncertainties.

7. CONCLUSION

In the proposed control scheme, the PSS parameters are attained by satisfying the five simple stability constraints and minimizing the stated objective function using the JAYA optimization algorithm. Robust stability conditions are obtained directly from the closed loop transfer function of SMIB power system given in interval polynomial form. Whereas for PSS [15] the controllers' parameters are tuned using the objective function that comprises eight kharitonov polynomials. The PSO optimization technique was employed to determine the design variables. Moreover, for PSS [14], the root locus is obtained for eight extreme kharitonov polynomial and controller values are determined. Hence computational efforts reduce greatly with the proposed control scheme since there is no need of formulating the kharitonov polynomials and tuning the PSS parameters. The attained PSS parameters stabilizes the system for wide operational states and simulation results exhibit the efficiency of the proposed lead lag PSS compared to the notable PSS techniques.

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Student Article

Life Cycle Assessment

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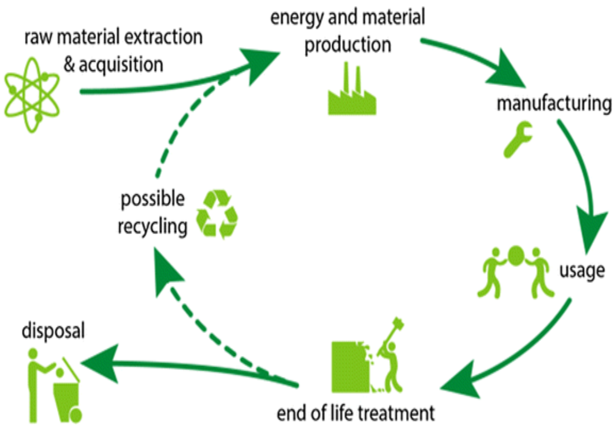
Life cycle assessment is a cradle to grave or cradle-to-cradle analysis technique to assess environmental impacts associated with all the stages of a product's life, which is from raw material extraction through materials processing, manufacture, distribution and use.Life cycle assessment is a technique for assessing the environmental aspects associated with a product over its life cycle.

The most important applications are :



• Analysis of the contribution of the life cycle stages to the overall environmental load, usually with the aim to prioritize improvements on products or processes

• Comparison between products for internal use

An LCA study consists of four stages:

Stage 1: Goal and scope aims to define how big a part of product life cycle will be taken in assessment and to what end will assessment be serving. The criteria serving to system comparison and specific times are described in this step.

Stage 2: In this step, inventory analysis gives a description of material interaction with environment, consumed raw materials, and emissions to the environment. All-important processes and subsidiary energy and material flows are described later.

Stage 3: Details from inventory analysis serve for impact assessment. The indicator results of all impact categories are detailed in this step; the importance of every impact category is assessed by normalization and eventually also by weighting.

Stage 4: Interpretation of a life cycle involves critical review, determination of data sensitivity, and result presentation.

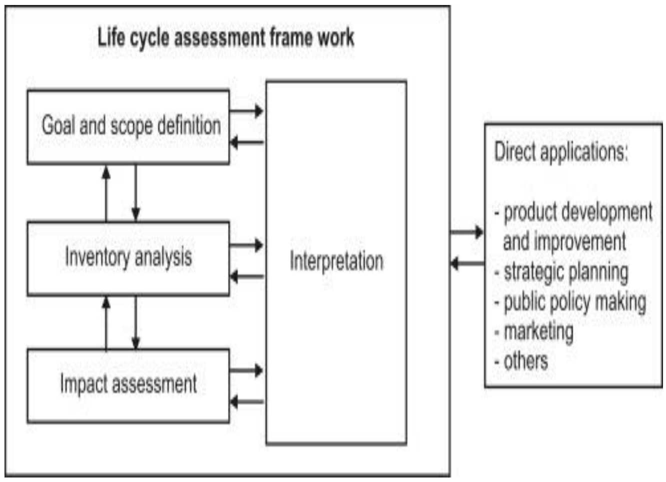


Figure gives the four stages under the ISO 14040 guidelines.

The utilization of LCA method can help in the following:

- Searching the most available life cycles, e.g., those with minimal negative impact on environment,
- Assuming the decisions in industry, public organizations, or NGOs, which determine direction and priorities in strategic planning, design or design product, or process change,
- Choose important indicators of environmental behavior of organization including measurement and assessing techniques, mainly in connection with the assessment of the state of its environment,
- Marketing with the link on formulation of environmental declaration or eco-labeling

Levels of LCA

LCA methodology can be categorised into three levels based on technological details:

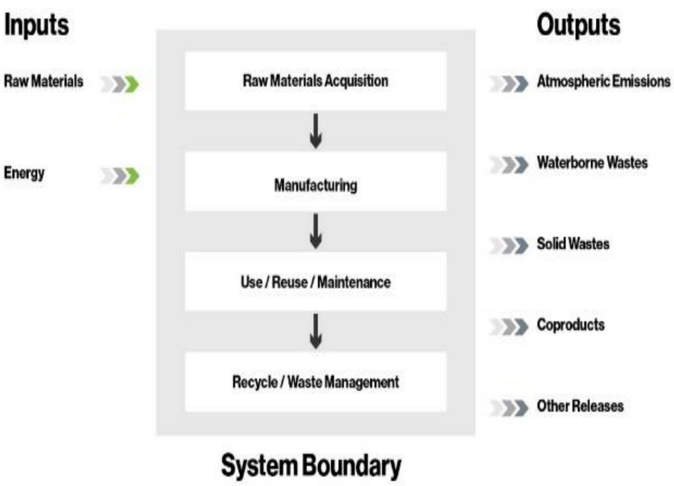
Conceptual LCA – First level of LCA based on limited environmental aspects of few life cycle stages where there is still some improvement potential existing for the manufacturer. The results might be useful for qualitative reporting of assessment results, but not suitable for corporate marketing or explicit publication of LCA study.

Simplified LCA – This is the type of comprehensive assessment using generic datasets covering the whole life cycle of a product/system of processes. The time required and expenditures as well reduce significantly here, which is a significant difference from detailed LCA. This consists of a screening of life cycle stages, simplification of LCA results for future recommendation and assuring the reliability of the analysis results. This is often termed as 'Streamlined LCA'.

Detailed LCA – This type of LCA is comprehensive with the full consideration of each life cycle stages with system-specific datasets and analysed in detail for further process improvement.

Product sustainability life cycle assessment:

LCA is the crux of eco-design, dealing with the design approach of a product with full consideration to the environmental impacts made by the product in its entire life cycle. The LCA analyses the effects on the environment by both the use of resources (inputs) and the emissions created by a given process (outputs).



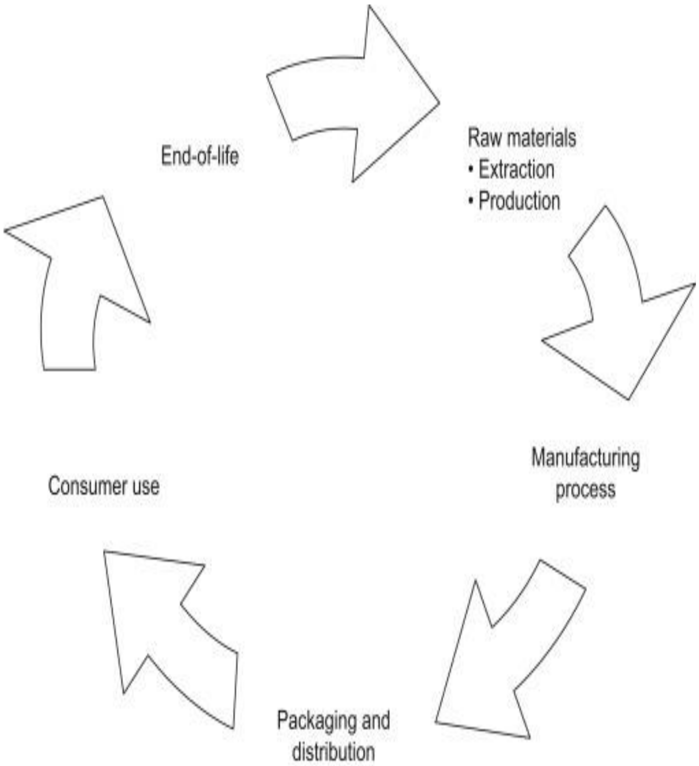
Inputs:

- Raw Materials
- \Water
- Chemicals And Other Auxiliaries.

Outputs:

- Product
- Co-Product
- Solid Waste
- Air Emissions
- Water Emissions
- Emissions To Land.

This whole quantification process starts at the raw material production and extraction phase, then spans the manufacturing process, progressing later into packaging, distribution, retail, use and disposal phases. The analysis is not complete once the different inputs and outputs have



been collected, this is only the initial step. These input and output details, termed as life cycle inventory, will be converted to mathematical models for analysis, a phase defined as 'impact assessment'. These impacts are then quantified in the LCA and related to a three-tier scale, namely, local, regional and global.

LCA can measure a long list of impacts on local, regional and global levels, for example,

- Climate Change (carbon footprint)
- Ecological Footprint
- Water Footprint
  Acidification

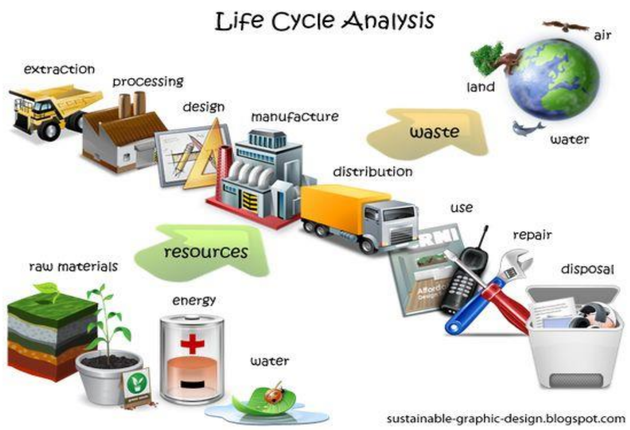
- Eutrophication
- Human Toxicity
- Energy Footprint
- Ozone Depletion Potential
- Photochemical Oxidation Potential Smog
- Depletion Of Biotic and Abiotic Resources
- Eco-Damage
- Land Use.
- LCA can be conducted for a range of products, processes and services.
- It can be performed in two steps: a screening or preliminary assessment and a detailed or full-scale assessment.
- LCA quantifications can be carried out in many forms, which are labelled as variants of LCA.
- Cradle to grave—a full life cycle assessment that includes all the stages of a life cycle.
- Cradle to gate—an LCA that deals only with the raw material extraction, production, manufacturing, packaging and transportation processes. It assesses only the activities that occur within the factory. It will not include the distribution, consumer use and disposal phases.
- Cradle to cradle – typically a cradle to grave assessment, where the end-of-lifestage of a product is a recycling process, thereby the product will not be discarded after the end of life.

Limitations of LCA

- LCA studies work on various assumptions and scenarios and assesses the real world in a simplified model, therefore sometimes lead to skepticism about LCA results.
- In addition, LCA is a data driven tool and if data quality is poor or insufficient data is available, the study will not lead to effective conclusions. Also, it is not easy to communicate outputs of a LCA study.
- LCA typically provides results on several environmental impacts and generate more than one product which create confusion. Further, a more detailed analysis is needed to explain the differences and highlight the benefits and drawbacks of both products.
- It can be difficult for decision makers to take precise decision. ISO Life Cycle Impact Assessment document (ISO/FDIS, 1999) specifically cautions that LCA does not predict actual impacts.

Future of LCA

- LCA is widely used in many organizations as a tool for environmental analysis, but nowadays LCA has also broadened to include life cycle costing (LCC) and social LCA (SLCA) covering all three dimensions of sustainability (i.e., people, planet, and prosperity).
- With these developments, LCA has broadened from merely environmental assessment to a more



comprehensive life cycle sustainability assessment (LCSA)

Student Project Paper

Electrical Vehicle Charging Station Using Solar Tree

R. Ramya (17JG1A0226), G. Praba (18JG5A0203), G.G. Deepika (18JG5A0204), K.Varsha (18JG5A0205) B. Sahithi (18JG1A0204), Mr.M.Krishna, Asst.Prof, Dr.A.Hema Chander, Asst.Prof. III EEE Dept GVPCEW

Abstract:
Solar Tree installed in the country either support grid on used for LED street lightning applications. The solar tree installed in the campus supports EV charging along with mobile and laptop charging. This is the first of its kind in an educational institution in and around Visakhapatnam. The solar tree is interfaced with the grid to support the EV charging during night times. A 250W solar tree with 12V battery has been installed in the campus.

Design Procedure:

The various steps followed for developing the solar tree are as follows

Step1: Selection of the rating of panels, battery and inverter.

Step2: Selection of the shape of the tree.

Step3: Structuring the layout.

Step4: Optimal selection of the angle of tilt and direction of placement.

Step5: Connections and installation of the solar tree.

Step:1

As this is the first project of its kind in the campus, a low rating has been selected. Initially the tree rating has been fixed as 250W with 5 branches (each of 50W). A proper selection of battery is equally important for supporting the laptop/mobile charging round the clock. A 12V LFP battery has been selected as the panels available are of 18V(peak). In order to charge/discharge the battery up to a longer time, a higher Ah rating of battery is required. Since the rating of the peak power of solar panel is 250W, the ampere ratings of battery should be 250/12=20.83A at max. For safer operation a 24Ah battery has been selected with a BMS of 30A.

As the basic aim of the project is charging E-bike, and each E-bike has different voltage ratings as well as individual chargers' conversion to AC is mandatory. Also, it is required to change the battery with solar power in this regard a solar inverter has been employed in the system. The rating of the inverter should match the power rating of the panel and battery, hence at least 500VA inverter is essential. However, to allow further increase in the capacity of solar panels, in the near future an 850VA inverter has been accommodated in the system.

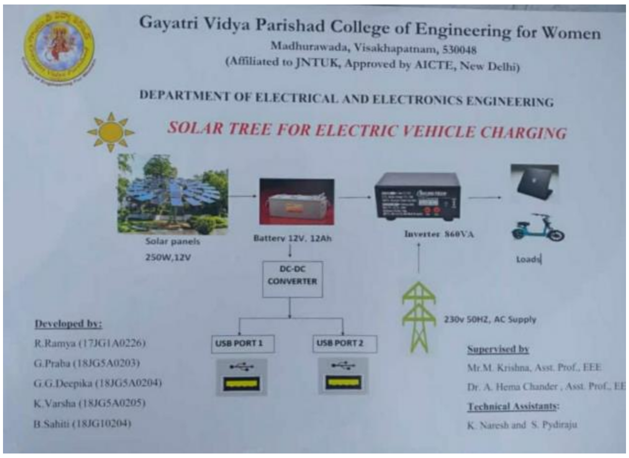


Fig:1. Block diagram of EV charging station using solar tree

Step2:

Selection of shape of the tree is crucial. It is not worthy that the branches of the tree should not create partial shading on the other panels. In this regard various shapes have been investigated. The major advantages of circular shape include:

- Does not have partial shading on other panels
- Easy to extend in future.

In this regard, the circular shape has been employed.

Step:3

The structuring layout and specification of panel and tree as follows:
Dimensions of solar panel: 55cm*57cm
Pole height: 10 feet
Branches length (panel rods): 4 feet
Round plate: 13cm,8mm(thickness)

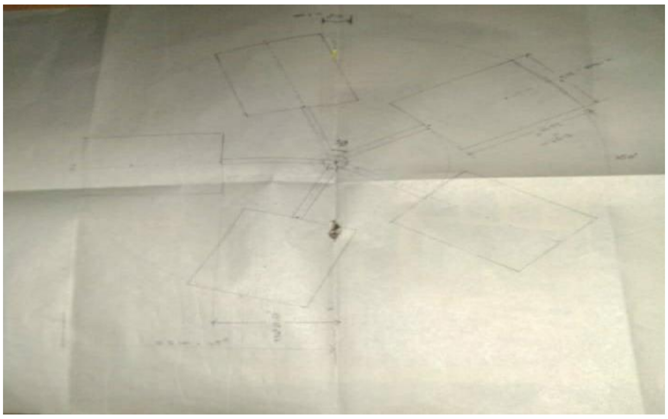


Fig.2. arrangement of panels

Step4:

Optimal selection of tilt angle and direction of placement:

In order to realize the maximum power throughout the year, it is a general practice to orient the panel from North-South direction. The tilt angle is the latitude angle of the location where installed tilt angle of the panel is 18 degrees.

Step5*:*

Construction and process of installation:

The solar tree consists of some important parts in its design. They are as follows:

- Solar panels
- Long pole
- Battery
- Stems for connecting the panels
- Inverter

First the panels are arranged in such a way that the angle between each panel is 72 degrees. Then these panels are welded by connecting the rods (stems) of length 4 feet. This entire structure is then welded to the circular plate of 13 cm diameter. Now this is connected to the pole of 10 feet with the help of angular plates and blots. With the help of angular plate, we can rotate the entire structure of branches of tree when the changes occur in solar radiation. The panels are placed on the basis of latitude angle of Visakhapatnam i.e.,18 degrees. And it is placed in the direction of north-south.

All the panels are connected together in parallel to obtain constant voltage. Then it is connected to inverter terminals along with battery.

Fig.3. developed solar tree for EV charging

Working:

The energy from the solar panels is stored in battery. Battery is charged during the day time and the output from battery is given to inverter. Then the inverter converts DC to AC. From the output terminals of inverter, we can charge the loads. We are also connected AC grid to the system for uninterrupted supply during cloudy days and no sunlight is there.

Conclusion:

The main aim of this project is uplifting the public opinion on Renewable Energy sources and promoting of electric vehicles. The major problem faced by user when using EVs is charge requirement. By constructing this type of charging stations using solar tree can increase the usage of electric vehicles by providing charge when it requires. To fulfil the requirement of charge for EVs where people need by saving of land, this project is very successful one

Faculty Journals

Journals published in the year 2021

Sl. No	Title of paper	Name of the author/s	Department of the teacher	Name of journal	ISSN number	Link to the recognition in UGC enlistment of the Journal
1	Design and implementation of a new inverter topology with reduced THD and part count	**Devendra Potnuru**	EEE	International journal of system assurance engineering and management	0975-6809	https://www.scopus.com/sourceid/19700177002
2	Control constraint based optimal PID-PSS design for a widespread operating power system using SAR algorithm	**Vijaya Lakshmi A.S.V**, Ramalinga Raju Manyala and Siva Kumar Mangipudi	EEE	International Transactions on Electrical Energy Systems	2050-7038	https://www.scopus.com/sourceid/21100241220
3	Stabilized Power Management in the Microgrid Using Unified Delta Controller	**Molli.Krishna**; Raj. P Ajay-D-Vimal; Subramaniam, N P. Sudhakaran, M.	EEE	Journal of Electric Systems	1112-5209	https://www.scopus.com/sourceid/19700186890
4	Usage Based Loss Allocation To Generators In Single Area Power System	D.Srilatha **,R.V.S. Lakshmi kumari ,** S.V.R.Lakshmi Kumari	EEE	International Journal on Design Engineering	0011-9342	https://www.scopus.com/sourceid/28687
5	Robust Observer Design for Mitigating the Impact of Unknown Disturbances on State of Charge Estimation of Lithium Iron Phosphate Batteries using Fractional Calculus	K D Rao, **A Hema Chander** and S Ghosh	EEE	IEEE Transactions on Vehicular Technology	0018-9545	https://www.scopus.com/sourceid/17393
6	Optimal Robust PID-PSS Design for Melioration of Power System Stability Using Search and Rescue Algorithm	**Vijaya Lakshmi A.S.V**, Ramalinga Raju Manyala and Siva Kumar Mangipudi	EEE	Journal of Control Automation and Electrical Systems	2195-3899	https://www.scopus.com/sourceid/21100244214

Faculty Conferences

Conference attended in the year 2021

Sl. No	Name of the teacher	Title of the paper/ book/chapters published	Name of the conference	National / International	ISBN/ISSN number of the proceeding	Name of the publisher
1	**Sree Vidhya Vaidyanadhan**, Guru Sumanth, Dr,.Sankar Peddapati and SVK Naresh	Inductor Switched Series Loaded Resonant Converter for LED Applications	IECON 2021 47th Annual Industrial Electronics Conference	International	https://www.scopus.com/sourceid/56670	IEEE
2	Mudadla Dhananjaya, Jagabar Sathik M, Sanjeevikumar Padmanaban, Dhafer Almakhles, **Devendra Potnuru**	A New Configuration of Switch and Source Fault-Tolerant Dual-Input Single-Output DC-DC Converter	2021 IEEE 4th International Conference on Computing, Power and Communication Technologies (GUCON)	International		IEEE
3	CH Kamesh Rao, S.Mishra, L K Sahu, Y Kishore, **A. H. Chander** and A K Tiwari	Electric Vehicle Charging Station Using ANPC Converter With Bipolar DC Bus	2021 IEEE 4th International Conference on Computing, Power and Communication Technologies (GUCON)	International		IEEE
4	CH Kamesh Rao, R N Patel, L K Sahu, Y Kishore, **A. H. Chander** and A K Tiwari	Design of ANPC Converter based DC Charging Station for Electric Vehicle	2021 Asian Conference on Innovation in Technology (ASIANCON)	International		IEEE
5	S.Mishra, L K Sahu, **A. H. Chander** and A K Tiwari	Modelling of Electric Vehicle Direct Current Fast Charging Station	2021 Asian Conference on Innovation in Technology (ASIANCON)	International		IEEE
6	CH Kamesh Rao, R N Patel, L K Sahu, Y Kishore, **A. H. Chander** and A K Tiwari	A Novel Non-Isolated Multiple Input DC/DC Boost Converter Topology	IEEE Sponsored First International Conference on Emerging Trends in Industry 4.0 (2021 ETI 4.0)	International		IEEE
7	**R.V.S.Lakshmi Kumari** and D.Srilatha	Lecture Notes in Networks and Systems ,Short Circuit Fault Analysis of Three Phase Transmission System using MATLAB	International Conference on Computational and BioEngineering	International	978-981-16-1940-3	Springer

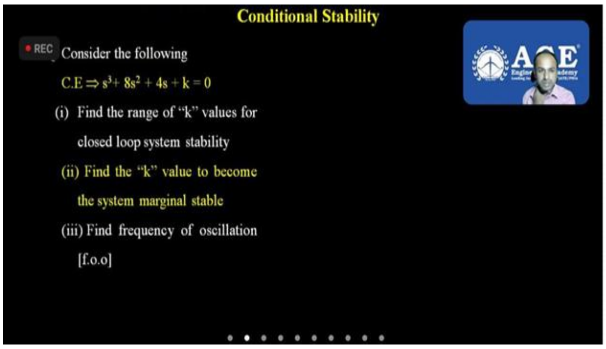
8	**Allamsetty Hemachnader**, Lalit Sahu, Subhojit Ghosh	"Multiple Input Converter for Photovoltaic Applications", Book Series: Energy Systems in Electrical Engineering	DC-DC Converters for Future Renewable Energy Systems		978-981-16-4387-3	Springer
9	Mayank Gautam and **K. V. S. Rao**	Lecture Notes in Electrical Engineering, Comparison of Five Fuel Cell Electric Vehicles. In: P., S., Prabhu, N., K., S. (eds)	Advances in Renewable Energy and Electric Vehicles,vol 767. Springer, Singapore.		978-981-16-1940-3	Springer
10	Vineet Kumar Mahaver and **K. V. S. Rao**	Lecture Notes in Electrical Engineering, Estimation of Levelized Cost of Electricity (LCOE) of 1 MW SPV Plants Installed at 33 Different Locations in Rajasthan, India. In: P., S., Prabhu, N., K., S. (eds)	Advances in Renewable Energy and Electric Vehicles,vol 767. Springer, Singapore.		978-981-16-1940-3	Springer
11	Divya Mittal and **K. V. S. Rao**	Lecture Notes in Electrical Engineering, Economic Analysis of Floating Photovoltaic Plant in the Context of India. In: P., S., Prabhu, N., K., S. (eds)	Advances in Renewable Energy and Electric Vehicles,vol 767. Springer, Singapore.		978-981-16-1940-3	Springer
12	Monika Agrawal and **K. V. S. Rao**	Lecture Notes in Electrical Engineering, Harnessing Solar Energy from Wind Farms: Case Study of Four Wind Farms. In: P., S., Prabhu, N., K., S. (eds)	Advances in Renewable Energy and Electric Vehicles,vol 767. Springer, Singapore.		978-981-16-1940-3	Springer
13	Varaprasad M.V.G., Arundhati B., **Allamsetty H.C.**, Bankupalli P.T	Machine Intelligence and Soft Computing. Advances in Intelligent Systems and Computing/ Design and Implementation of a Modified H-Bridge Multilevel Inverter with Reduced Component Count	Part of the Advances in Intelligent Systems and Computing book series (AISC, volume 1280)		978-981-15-9515-8	Springer

Department Activities

Department Activities Organized for the Year 2020-2021

S.NO	Activity type	Name of the Topic/subject	Date	Resource Person / Judge		Participation
1.	Energy conversation week-Azadika Amrit Mahostav:Energy efficient India	Rain Harvesting and Energy Efficient Home Appliances	21-12-2021	Dept of EEE, GVPCEW		Faculty and students of GVPCEW
2.	Energy conversation week-Azadika Amrit Mahostav:Energy efficient India	Electric Vehicles and Retrofitting of EV	16-12-2021	Dept of EEE, GVPCEW		Faculty and students of GVPCEW
3.	Refresher Course	E-mobility and Battery Charging	9-12-2021 to 15-12-2021	Prof.Ch.Sai Baba JNTUK, Kakinada	Dr.Nishant Kumar IIT,Jodhpur	Faculty III & IV EEE
				Dr.M. Sontosh Kumar TCS, Pune	Dr.Sreedhar Madichetty Mahindra University, Hyderabad	
				Dr. Sankar Peddapati NIT, Andhra Pradesh	Mr.Ashhar Ahmed SkillShark Edu Tech, Hyderabad	
				Dr. T Vinay Kumar NIT, Warangal	Dr. A hema Chander NIT, Pudicherry	
				Dr. Ranjan Kumar Behara IIT, Patna	Dr. N. k. Swami Naidu IIT-BHU, Varanasi	
				Prof. C. V. K. Bhanu GVPCE (A), Vizag	Dr. V. Sivani GVPMC, Vishakapatnam	
4.	Guest Lecture	Electrification of Automobiles	11-09-2021	Dr. M. Santosh Kumar TCS, Pune		III & IV EEE
5.	Webinar	Career opportunities after B.Tech.	13-05-2021	ACE Academy Resource Person		II, III & IV EEE
6.	Placement Activity	Career Development & Smart Goals	08-02-2021	Dr. P Venkata Rao Chairman, T & P GVP College of Engineering, Visakhapatnam		III EEE

7.	Hardware Expo	Inauguration of Solar Tree and Hardware Expo	26-01-2021	Prof. P S Rao (chief guest) President Gayatri Vidya Parishad Visakhapatnam	III & IV EEE
8.	Industrial visit	2MW Floating Solar Power Plant, Mudasarlova Visakhapatnam	23-01-2021	Mr. U Mahesh Site in-charge, PES Engineering Pvt. Ltd.	III-EEE
9.	Alumni Meet	Opportunities in Industry	09-01-2021	E. Sri. Vidya Executive Engineer, Continental Automotive Components, Bangalore A. Sravani System Engineer TCS, Hyderabad	II, III & IV EEE



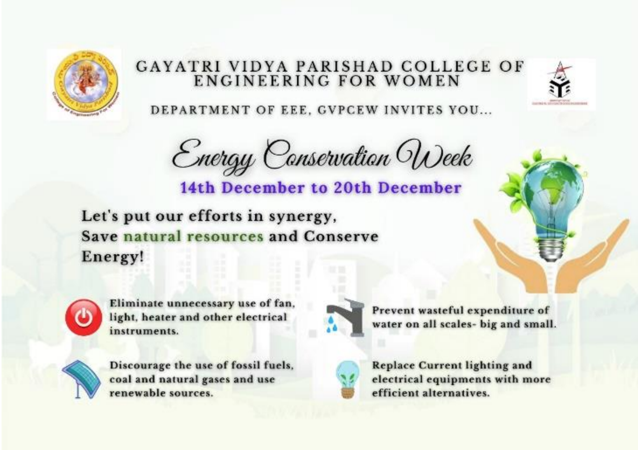
నూతన ఆవిష్కరణలు చేపట్టాలి: 'గాయత్రి' అధ్యక్షుడు పీఎస్ రావు

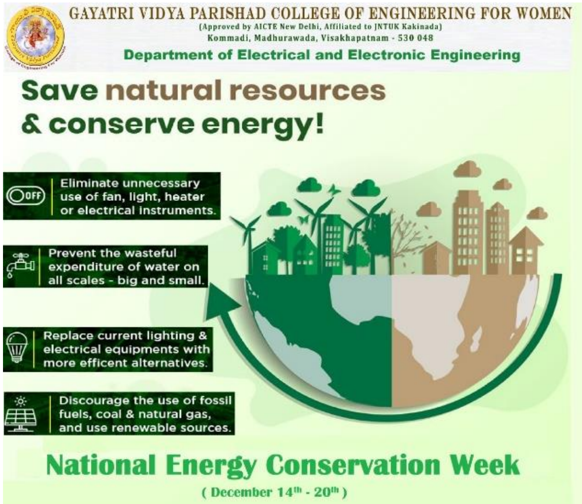
కొమ్మాది, జనవరి 26: విద్యార్థులు సాంకేతిక రంగంలో పట్టు సాధించి నూతన ఆవిష్కరణలను చేపట్టాలని గాయత్రి విద్యాపరిషత్ అధ్యక్షుడు పీఎస్ రావు పేర్కొన్నారు. గాయత్రి విద్యాపరిషత్ మహిళా ఇంజనీరింగ్ కళాశాలలో మంగళవారం నిర్వహించిన గణతంత్ర దినోత్సవానికి ఆయన ముఖ్యఅతిథిగా హాజరయ్యారు. ఈ సందర్భంగా మహిళా ఇంజనీరింగ్ కళాశాల ఎలక్ట్రికల్ విభాగం విద్యార్థినులు రూపొందించిన సౌరశక్తితో పనిచేసే ఎలక్ట్రికల్ వెహికల్ చార్జింగ్ స్టేషన్‌ను ఆయన ప్రారంభించి మాట్లాడారు. ప్రస్తుతం వాహన కాలుష్యాన్ని తగ్గించడానికి ఎలక్ట్రికల్ వాహనాలు వినియోగంలోకి వస్తున్నాయన్నారు. తమ విద్యార్థినులు అతి తక్కువ ఖర్చుతో రూపొందించిన ఈ ఎలక్ట్రికల్ వాహనాల చార్జింగ్ స్టేషన్‌ను రహదారుల వద్ద ఏర్పాటుచేస్తే ఆయా వాహనదారులకు ఉపయుక్తంగా ఉంటుందన్నారు. దీనిని తయారుచేసిన విద్యార్థినులు రమాదేవి, ప్రభ, దీపిక, వర్ష, సాహితిలతో పాటు వారికి మెంటర్లుగా వ్యవహరించిన ఆచార్య కృష్ణ, అసిస్టెంట్ ప్రొఫెసర్ ఎ.హేమచంద్రర్‌లను అభినందించారు. కార్యక్రమంలో కళాశాల కార్యదర్శి పులగుర్త సోమరాజు, గాయత్రి విద్యాపరిషత్ మాజీ అధ్యక్షుడు ప్రసాద్, తదితరులు పాల్గొన్నారు. విద్యార్థినులు ఏర్పాటు చేసిన సాఫ్ట్‌వేర్, హార్డ్‌వేర్ ఎగ్జిబిషన్ అందరినీ ఆకట్టుకుంది.

విద్యార్థినులు రూపొందించిన ఎలక్ట్రికల్ చార్జింగ్ స్టేషన్ వద్ద పీఎస్ రావు, తదితరులు


DIESEL VEHICLES AND PETROL VEHICLES
"Search for a solution to put an end to pollution"
DON'T BE FOOLISH! "CONSERVING FUEL IS OUR RESPONSIBILITY."
SPECIFICATIONS OF PETROL AND DIESEL VEHICLES
MONTHLY FUEL EXPENDITURE
MARUTI SUZUKI CELERIO (PETROL) | MARUTI SUZUKI CELERIO(CNG)
FUEL ECONOMY
COST OF FUEL/ LITRE | RS 115.0 | RS 100
MONTHLY FUEL CONSUMPTION
DAILY TRAVEL COST | RS 159.5
MONTHLY TRAVEL COST | RS 4785.15 | RS 2849
INCREASES FUEL COSTS
INCREASES ENVIRONMENTAL POLLUTION
INCREASES THE MAINTAINENCE COSTS
WPS Office


Save natural resources & conserve energy!


GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
DEPARTMENT OF EEE, GVPCEW INVITES YOU...
Energy Conservation Week
14th December to 20th December
Let's put our efforts in synergy, Save natural resources and Conserve Energy!
Eliminate unnecessary use of fan, light, heater and other electrical instruments.
Prevent wasteful expenditure of water on all scales- big and small.
Discourage the use of fossil fuels, coal and natural gases and use renewable sources.
Replace Current lighting and electrical equipments with more efficient alternatives.


GAYATRI VIDYA PARISHAD COLLEGE OF ENGINEERING FOR WOMEN
(Approved by AICTE New Delhi, Affiliated to JNTUK Kakinada)
Kommadi, Madhurawada, Visakhapatnam - 530 048
Department of Electrical and Electronic Engineering
Save natural resources & conserve energy!
Eliminate unnecessary use of fan, light, heater or electrical instruments.
Prevent the wasteful expenditure of water on all scales - big and small.
Replace current lighting & electrical equipments with more efficent alternatives.
Discourage the use of fossil fuels, coal & natural gas, and use renewable sources.
National Energy Conservation Week
(December 14th - 20th)


Save natural resources & conserve energy!

Student Activities

PARTICIPATION OF STUDENTS IN VARIOUS EVENTS

Course conducted by: Pantech e learning

S. No	Roll No	Name Of the Student	Course	Time Period
1.	19JG1A0201	B. Mounika	IOT	20Sept-19 Oct 2021
2.	19JG1A0202	B. Padmini	IOT	20Sept-19 Oct 2021
3.	19JG1A0204	C.V.S.S. Lakshmi	IOT	20Sept-19 Oct 2021
4.	19JG1A0205	S. Divya	IOT	20Sept-19 Oct 2021
5.	19JG1A0206	E. Gayatri	IOT	20Sept-19 Oct 2021
6.	19JG1A0207	Gayatri Panda	IOT	20Sept-19 Oct 2021
7.	19JG1A0209	G. Greeshma	IOT	20Sept-19 Oct 2021
8.	19JG1A0210	G.T. Thoyajakshi	IOT	20Sept-19 Oct 2021
9.	19JG1A0211	G. Sravani	IOT	20Sept-19 Oct 2021
10.	19JG1A0212	G. Sai Charanya	IOT	20Sept-19 Oct 2021
11.	19JG1A0213	G. Sai Keerthi	IOT	20Sept-19 Oct 2021
12.	19JG1A0214	J. Keerthi	IOT	20Sept-19 Oct 2021
13.	19JG1A0217	L. Durga Sravani	IOT	20Sept-19 Oct 2021
14.	19JG1A0218	M. Priyanka	IOT	20Sept-19 Oct 2021
15.	19JG1A0220	M. Ramyasri	IOT	20Sept-19 Oct 2021
16.	19JG1A0221	N.V. Sri Ramya	IOT	20Sept-19 Oct 2021
17.	19JG1A0223	P. Divyanjali	IOT	20Sept-19 Oct 2021
18.	19JG1A0224	P. Jyothsna	IOT	20Sept-19 Oct 2021
19.	19JG1A0225	P. Divya	IOT	20Sept-19 Oct 2021
20.	19JG1A0226	R. Sravani	IOT	20Sept-19 Oct 2021
21.	19JG1A0227	S. Deepthi	IOT	20Sept-19 Oct 2021
22.	19JG1A0228	S. Haindavi	IOT	20Sept-19 Oct 2021
23.	19JG1A0229	S. Malavika	IOT	20Sept-19 Oct 2021
24.	19JG1A0230	T. Durga Sravani	IOT	20Sept-19 Oct 2021
25.	20JG5A0202	B. Padma	IOT	20Sept-19 Oct 2021
26.	20JG5A0203	CH. Nandini Priya	IOT	20Sept-19 Oct 2021
27.	20JG5A0204	I. Pravallika	IOT	20Sept-19 Oct 2021
28.	20JG5A0205	K. Chandini	IOT	20Sept-19 Oct 2021
29.	20JG5A0207	K. Karuna	IOT	20Sept-19 Oct 2021
30.	20JG5A0213	P. Devi Sravya	IOT	20Sept-19 Oct 2021
31.	20JG5A0217	P. Haritha	IOT	20Sept-19 Oct 2021
32.	20JG5A0221	Y. Jyoshna	IOT	20Sept-19 Oct 2021
33.	20JG5A0222	Y.Amrutha	IOT	20Sept-19 Oct 2021

PARTICIPATION OF STUDENTS:

Course conducted by: Pantech e learning,

S.NO	Roll No	Name Of the Student	Course	Time period
1.	19JG1A0201	B. Mounika	Renewable energy master class	18Oct-17Nov 2021
2.	19JG1A0202	B. Padmini	Renewable energy master class	18Oct-17Nov 2021
3.	19JG1A0204	C.V.S.S. Lakshmi	Renewable energy master class	18Oct-17Nov 2021
4.	19JG1A0205	S. Divya	Renewable energy master class	18Oct-17Nov 2021
5.	19JG1A0206	E. Gayatri	Renewable energy master class	18Oct-17Nov 2021
6.	19JG1A0207	Gayatri Panda	Renewable energy master class	18Oct-17Nov 2021
7.	19JG1A0208	G.D. Charanya	Renewable energy master class	18Oct-17Nov 2021
8.	19JG1A0209	G. Greeshma	Renewable energy master class	18Oct-17Nov 2021
9.	19JG1A0210	G.T. Thoyajakshi	Renewable energy master class	18Oct-17Nov 2021
10.	19JG1A0211	G. Sravani	Renewable energy master class	18Oct-17Nov 2021
11.	19JG1A0212	G. Sai Charanya	Renewable energy master class	18Oct-17Nov 2021
12.	19JG1A0213	G. Sai Keerthi	Renewable energy master class	18Oct-17Nov 2021
13.	19JG1A0214	J. Keerthi	Renewable energy master class	18Oct-17Nov 2021
14.	19JG1A0217	L. Durga Sravani	Renewable energy master class	18Oct-17Nov 2021
15.	19JG1A0218	M. Priyanka	Renewable energy master class	18Oct-17Nov 2021
16.	19JG1A0219	M. Roshini mani	Renewable energy master class	18Oct-17Nov 2021
17.	19JG1A0220	M. Ramya Sri	Renewable energy master class	18Oct-17Nov 2021
18.	19JG1A0221	N.V.S. Ramya	Renewable energy master class	18Oct-17Nov 2021
19.	19JG1A0223	P. Divyanjali	Renewable energy master class	18Oct-17Nov 2021
20.	19JG1A0224	P. Jyothsna	Renewable energy master class	18Oct-17Nov 2021
21.	19JG1A0225	P. Divya	Renewable energy master class	18Oct-17Nov 2021
22.	19JG1A0226	R. Sravani	Renewable energy master class	18Oct-17Nov 2021
23.	19JG1A0227	S. Deepthi	Renewable energy master class	18Oct-17Nov 2021

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31.	20JG5A0206	K.S. Shiva Priya	Renewable energy master class	18Oct-17Nov 2021
32.	20JG5A0207	K. Karuna	Renewable energy master class	18Oct-17Nov 2021
33.	20JG5A0208	M. Gayathri	Renewable energy master class	18Oct-17Nov 2021
34.	20JG5A0209	M. Bhargavi	Renewable energy master class	18Oct-17Nov 2021
35.	20JG5A0210	Neelam Kamala Priya	Renewable energy master class	18Oct-17Nov 2021
36.	20JG5A0211	Nikku. Bhavani	Renewable energy master class	18Oct-17Nov 2021
37.	20JG5A0213	P. Devi Sravya	Renewable energy master class	18Oct-17Nov 2021
38.	20JG5A0217	P. Haritha	Renewable energy master class	18Oct-17Nov 2021
39.	20JG5A0218	R. Naga Saranya	Renewable energy master class	18Oct-17Nov 2021
40.	20JG5A0219	T.Archana	Renewable energy master class	18Oct-17Nov 2021
41.	20JG5A0220	T. Lavanya	Renewable energy master class	18Oct-17Nov 2021
42.	20JG5A0221	Y. Jyoshna	Renewable energy master class	18Oct-17Nov 2021

INTERSHIP of STUDENTS:

Course conducted by: Pantech e learning

S.NO	Roll No	Name Of the Student	Course	Time Period
1.	19JG1A0201	B. Mounika	Renewable energy master class	18Oct-17Nov 2021
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3.	19JG1A0204	C.V.S.S. Lakshmi	Renewable energy master class	18Oct-17Nov 2021
4.	19JG1A0205	S. Divya	Renewable energy master class	18Oct-17Nov 2021
5.	19JG1A0206	E. Gayatri	Renewable energy master class	18Oct-17Nov 2021
6.	19JG1A0207	Gayatri Panda	Renewable energy master class	18Oct-17Nov 2021
7.	19JG1A0208	G.D. Charanya	Renewable energy master class	18Oct-17Nov 2021
8.	19JG1A0209	G. Greeshma	Renewable energy master class	18Oct-17Nov 2021
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12.	19JG1A0213	G. Sai Keerthi	Renewable energy master class	18Oct-17Nov 2021
13.	19JG1A0214	J. Keerthi	Renewable energy master class	18Oct-17Nov 2021
14.	19JG1A0217	L. Durga Sravani	Renewable energy master class	18Oct-17Nov 2021
15.	19JG1A0218	M. Priyanka	Renewable energy master class	18Oct-17Nov 2021
16.	19JG1A0220	M. Ramya Sri	Renewable energy master class	18Oct-17Nov 2021
17.	19JG1A0221	N.V.S. Ramya	Renewable energy master class	18Oct-17Nov 2021
18.	19JG1A0223	P. Divyanjali	Renewable energy master class	18Oct-17Nov 2021
19.	19JG1A0224	P. Jyothsna	Renewable energy master class	18Oct-17Nov 2021
20.	19JG1A0225	P. Divya	Renewable energy master class	18Oct-17Nov 2021
21.	19JG1A0226	R. Sravani	Renewable energy master class	18Oct-17Nov 2021
22.	19JG1A0227	S. Deepthi	Renewable energy master class	18Oct-17Nov 2021
23.	19JG1A0230	T. Durga Sravani	Renewable energy master class	18Oct-17Nov 2021
24.	20JG5A0203	CH. Nandini Priya	Renewable energy master class	18Oct-17Nov 2021

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26.	20JG5A0206	K.S. Shiva Priya	Renewable energy master class	18Oct-17Nov 2021
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31.	20JG5A0213	P. Devi Sravya	Renewable energy master class	18Oct-17Nov 2021
32.	20JG5A0215	P. Chaitanyasai	Renewable energy master class	18Oct-17Nov 2021
33.	20JG5A0216	P. Harshitha	Renewable energy master class	18Oct-17Nov 2021
34.	20JG5A0217	P. Haritha	Renewable energy master class	18Oct-17Nov 2021
35.	20JG5A0218	R. Naga Saranya	Renewable energy master class	18Oct-17Nov 2021
36.	20JG5A0220	T. Lavanya	Renewable energy master class	18Oct-17Nov 2021
37.	20JG5A0221	Y. Jyoshna	Renewable energy master class	18Oct-17Nov 2021

Value Added Courses:

Name Of the Student	Roll.No	Internship did at	Internship	Time Duration
Rokkala Sravani	19JG1A0226	Techmonk project solutions	Embedded systems	6/4/2021-26/6/21
Neralla Vindya Sri Ramya	19JG1A0221	Techmonk	Embedded systems	26/6/2021-26/6/21
Bikkina Sahithi	18JG1A0204	BSNL		5/5/2021

Extracurricular activities

Name Of the Student	Roll No	Type Of Activity	Activity	Conducted By	Conducted on
Patnana Devi Sravya	20JG5A0213	Drawing	Pencil arts	Raghu college	15/6/2021
C.V.S.S. Lakshmi	19JG1A0204	Essay writing (1^{st}place)	Media bias in Indian TV Channels	GVPCEW	26/1/2021

All the Difference in The World

Every Sunday morning. Varun takes a light jog around a park near his home. There's a lake located in one corner of the park. Each time he jogged by this lake; he saw the same elderly woman sitting at the water's edge with a small metal cage sitting beside her. This past Sunday his curiosity got the best of him, so he stopped jogging and walked over to her. As he got closer, he realized that the metal cage was, in fact, small trap. There were turtles, unharmed, in her lap that she was carefully scrubbing with a sponge brush.

"Hello," he said. "I see you here every Sunday morning. If you don't mind my nosiness, I'd love to know what you're doing with these turtles." She smiled. "I'm cleaning off their shells," she replied. "Anything on a turtle's shell, like algae or scum, reduces the turtle's ability to absorb heat and impedes its ability to swim. It can also corrode and weaken the shell over time."

"Well, don't you think your time could be better spent? I mean, I think your efforts are kind and all, but there are freshwater turtles living in lakes all around the world. And 99% of these turtles don't have kind people like you to help them clean off their shells. So, no offense... but how exactly are your localized efforts here truly making a difference?" The woman giggled aloud. She then looked down at the turtle in her lap and said. "Sweetie, if this little guy could talk, he'd tell you I just made all the difference in the world."

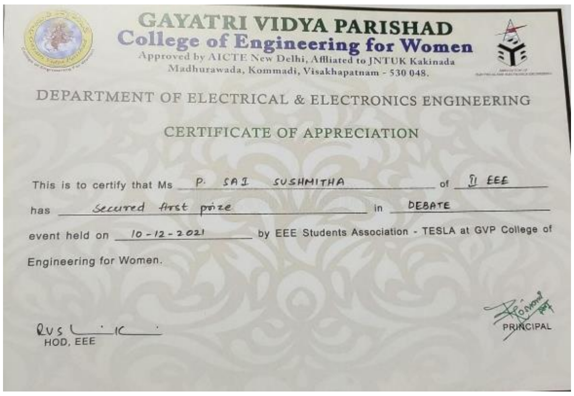
The Moral of the Story: Each one of us can change the world. Maybe we can't change the world right away but a single good deed will resonate with the rest of the world. Make every day count by knowing that you are capable of so much good, you just need to be brave to make the world a better place!

S. Divya-19JG1A0205

III B. Tech EEE

TELSA ACTIVITIES:

S.No	Activity Name	Topic	Conducted on	participation	winners
1.	Poster presentation	Electrical scientists		III&IV	-
2.	Dumb charades &Antakshari	Movies	28/10/2021	II&III	-
3.	Essay writing	Energy conservation		II&III	A. Lakshmi Chaitanya - 20JG1A0202 R. Naga Saranya - 20JG5A0218
4.	Quiz	Technical	8/10/2021	II, III& IV	1. N Vindhya Sri Ramya-19jg1a02211 2. P Divya 19/G1a0225 3. T Lavanya-20jg5a0220 4. Y Jyoshna-20jg5a0221
5.	JAM	Individual topics	5/11/2021	II, III	1" PRIZE: Ch. Sirisha-20jg1a0211 2ND PRIZE: Pravallika 20jg5a0214
6.	Debate	Current Affairs		II, III	1. G Neelima-20jg1a0215 2. P Sai Sushmitha-20jg1a0224 3. T lakshmi Kousalya-201g1a0230 4. R Naga Sri Lakshmi Sai-20/G1a0225
7.	Group discussion	Current Affairs	10/12/2021	II, III& IV	1. G Neelima-201g1a0215 2. N Pujitha-201g1a0220 3. S Akhila 20jg1a0229 4. T kousalya-20jg1a0230


GAYATRI VIDYA PARISHAD
College of Engineering for Women
Approved by AICTE New Delhi, Affiliated to JNTUK Kakinada
Madhurawada, Kommadi, Visakhapatnam - 530 048.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

CERTIFICATE OF APPRECIATION

This is to certify that Ms P. SAI SUSHMITHA of II EEE has secured first prize in DEBATE event held on 10-12-2021 by EEE Students Association - TESLA at GVP College of Engineering for Women.

HOD, EEE

PRINCIPAL


GAYATRI VIDYA PARISHAD
College of Engineering for Women
Approved by AICTE New Delhi, Affiliated to JNTUK Kakinada
Madhurawada, Kommadi, Visakhapatnam - 530 048.

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

CERTIFICATE OF APPRECIATION

This is to certify that Ms T. LAVANYA of III EEE has secured first place in TECHNICAL QUIZ event held on 8-10-2021 by EEE Students Association - TESLA at GVP College of Engineering for Women.

HOD, EEE

PRINCIPAL

TOPPERS OF THE YEAR

Year	Roll No	Name of the Student	Average GPA	Position
II	20JG5A0220	T.Lavanya	8.36	First-class with Distinction
III	18JG1A0205	Deepa Jain	8.19	First-class with Distinction
IV	17JG1A0220	P.Saranya	9.00	First-class with Distinction

PLACEMENTS:

S. No	Name	ROLL. No	Placement
1	BETHAPUDI PALLAVI	17JGIA0204	Infosys
2	BHAVANI SAGENI	17JGIA0205	Infosys
3	CHADUVULA GAYATRI	17JGIA0207	Cognizant
4	DABBIRU KEERTHI	17JGIA0208	Infosys
5	GARA PRASANTHI	17JGIA0209	Accenture
6	JERRIPOTHULA JAHNAVI	17JGIA0210	Cognizant
7	KETHAGANI SAI MADHULIKHA	17JGIA0211	Infosys
8	K DHANA LAKSHMI	17JGIA0212	Capgemini
9	KORUMILLI VENKATA VINAYA SUSHMA	17JGIA0214	Wipro
10	KOTNI JAYA SRI	17JGIA0215	Capgemini
11	MIRYABBELLI CHANDU	17JGIA0217	TCS
12	NAMASWI MALLA	17JGIA0219	Accenture
13	PALAKURTHI SARANYA	17JGIA0220	Infosys
14	PINCHINGULA DIVYA	17JGIA0223	Cognizant
15	RAVADA POOJYA LAKSHMI SAI SRUTHI	17JGIA0225	Deloitte
16	REDDI RAMYA	17JGIA0226	TCS
17	SALAPU UMA MAHESWARI	17JGIA0227	Infosys
18	SANCHANA POOJITHA VANI	17JGIA0228	Accenture
19	UDIYANA RAMYA	17JGIA0231	TCS
20	VYAKARANAM HARIKA	17JGIA0234	Deloitte
21	KODA JAHNAVI KRISHNA	17JGIA0236	Wipro
22	CHUNDURI YAMINI	18JG5A0202	TCS
23	KONAPARTY V M L KANAKA VARSHA	18JG5A0205	Onesta Engineering Services
24	MERAKA. SUNEETHA	18JG5A0206	Wipro
25	SADASIVUNI SAI SANGEETHA	18JG5A0208	Tech Mahendra
26	Y SOWMYA	18JG5A0209	TCS
27	BANDARU DEVI NAGA KALYANI	17JGIA0203	Capgemini
28	VELAGA HEMASRI	17JGIA0233	Infosys

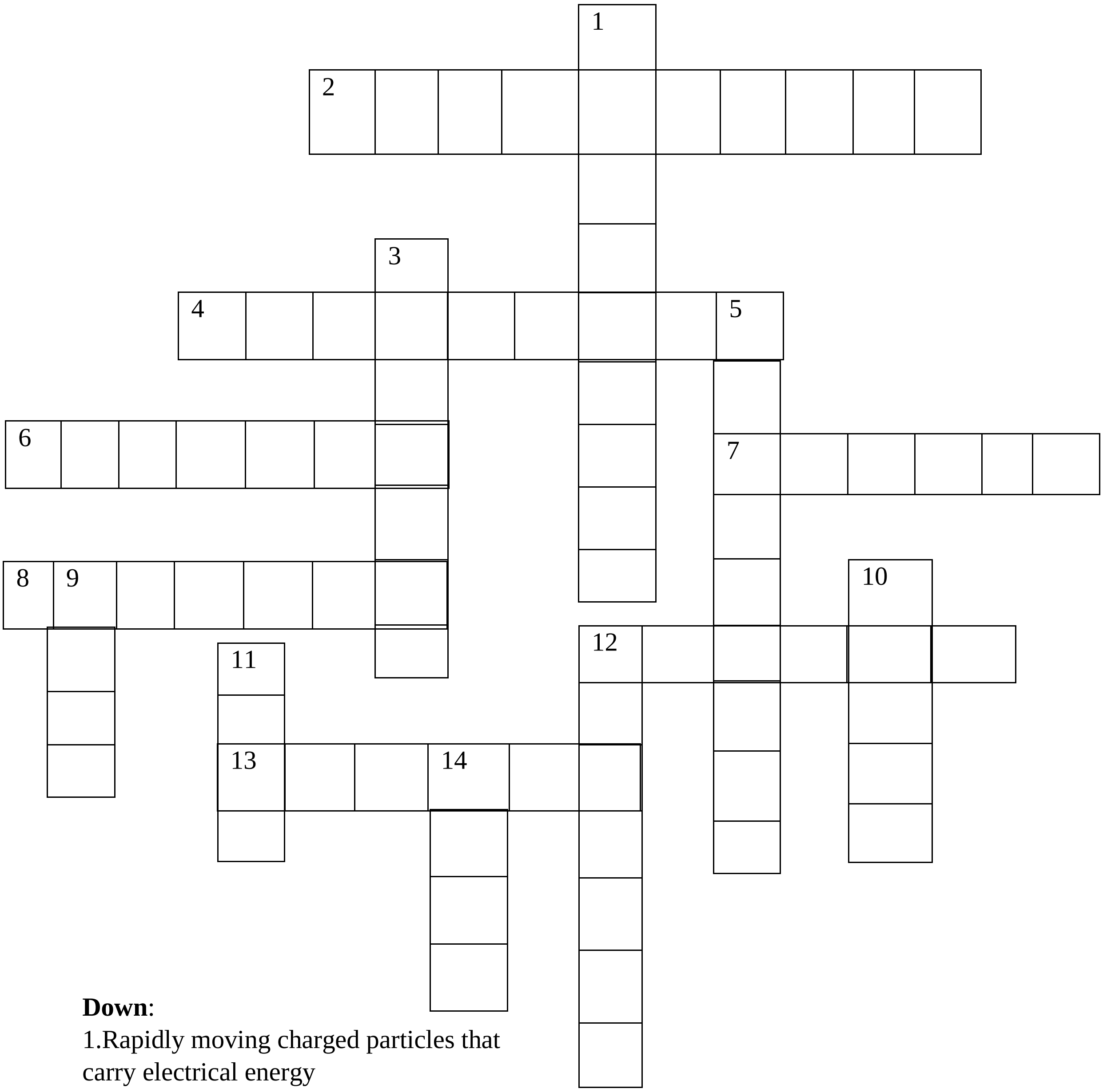
Vocabulary

VOCABULARY – NEW ENGLISH WORDS (with meanings)

S.No	Word	Meaning	Sentence
1.	Legible	Clear	It was clear and frosty
2.	Awed	Overcome with anger	The little girl was awed with silence
3.	Wanderlust	A strong desire to travel	A man consumed by wanderlust
4.	Futile	Vain, useless	He sighed at the futile thoughts
5.	Farouche	A shy person	How farouche you are!
6.	Atrocity	An extremely wicked or cruel act	A textbook that detailed war atrocities
7.	Acquit	To relieve from a charge of fault or crime	They acquitted him of the crime
8.	Dabster	An expert	I am a dabster in cooking and singing
9.	Enormity	The great or extreme scale	I never dreamed of any enormity greater than I have committed
10.	Buzzy	Lively and exciting	There is a nice, buzzy atmosphere and good service
11.	Vista	A pleasing view	The vista of Kashmir really make me feel in heaven
12.	Cuddle	Hug	She looked over at her and cuddled closer
13.	Scrutinize	Examine or inspect closely and thoroughly	Customers were warned to scrutinize the small print
14.	procrastinate	The action of delaying or postponing something	My project is late because I constantly procrastinate
15.	Ambiguous	Expression	Their actions showed moral ambiguity
16.	Fugitive	A person who flees or escapes to avoid prosecution	The fugitive is believed to be headed for the Canadian border
17.	Frowny	Disapproving or disliking	Harmony's frown was fierce
18.	Anticipate	To know of something before it happens; to expect	It's always best to anticipate the problems before they arise

S.No	Word	Meaning	Sentence
19.	Lucid	Clear, easily understood	His speech was lucid
20.	Exhausted	Tired	I was exhausted because I stayed up all night my homework
21.	Heaped	A collection of things thrown one on another	He accepted the platter of food and heaped his plate
22.	Exodus	Immigration, departure	Villages are dying because of the exodus of people to the cities
23.	Leap	Bounce, jump	I enjoyed while watching the stunts in the movie, where the actor was leaping from the buildings
24.	Abject	Sunk to or existing in a low state	The poor surroundings caused abject misery
25.	Miserable	Very unhappy	He was miserable with his work
26.	Evanesce	To disappear gradually	She evanesces over the hill and into morning's fog
27.	possessive	Demanding someone's total attention and love	She felt possessive of her art as he did his music
28.	Stout	Strong	He cut a stout stick to help him walk.
29.	Secular	Not spiritual or religious	The biggest change from halloween's earliest roots is that it became more secular than religious
30.	compassion	Pity	There is no need show compassion to him
31.	Demure	Shy, modest and well behaved	Hannah is very demure and sweet
32.	Serene	Peaceful and calm; worried by nothing	Natalie always has a serene smile on her face
33.	Nomophobia	Fear of being detached from mobile phone connectivity	We all have nomophobia

Cross Word



Down:
1.Rapidly moving charged particles that carry electrical energy
3.Source of electric Current.
5.The device prevents them from burning parts of an electronic device
19.A type of Circuit where there is a discontinuation of the conducting wire.
10.A good conductor of electricity.
11. It is used to connect the positive and negative each of a battery.
12.A path through which electricity can flow.
14.-Also known as load

Across:
2. This protect us from getting electrocuted.
4. A device that stores and releases energy which faster than a battery.
6. The flow of electric charge.
7.A gap in The Conductor where you can close or open the circuit
7.A gap in The Conductor where you can close or open the circuit
8.Material used for making Conductor wire
12.A type of Circuit where there is no break (or) discontinuation in the Conducting wire.
13. A bad Conductor of electricity.

Divya Anjali-19JG1A0223
Archana-20JG5A0219
III B. TECH EEE

Pencil Sketch

G. Keerthi-19JG1A0213

G. Keerthi-19JG1A0213

G. Keerthi-19JG1A0213

G. Keerthi-19JG1A0213

P. Sravya-20JG5A0213

R. Sravani-19JG1A0226

Editorial Team

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Ms. P. Devi. Sravya	:20JG5A0213
Ms. I. Pravallika	:20JG5A0504
Ms. P.S. Sushmitha	:20JG1A0224

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