

5.6 Innovations by faculty in Teaching and Learning -

A. Statement of clear goals, use of appropriate methods, significance of results, effective presentation

Goals and Usage of Appropriate Methods:

1. All the faculty members are required to attend one FDP per Semester.
2. All the faculty members are required to complete one MOOCS certificate per Year.
3. Doctorate faculty need to publish two papers either in indexed Journals or Conferences.
4. Other faculty members have to publish one paper in indexed Journals or Conferences.
5. Non doctorates have to register for Ph.D.
6. Faculty members need to use at least one innovative teaching and Learning Methodology.
7. Students are encouraged to attempt GATE with special coaching to the interested and merit students.
8. Students are encouraged to do NPTEL courses to increase their knowledge base about the subject.
9. Virtual labs to be included for programming subjects.
10. Faculty members have to see that E-content of respective subjects is available to students.
11. Mode of teaching in this institute is not only limited to the traditional Chalk & Talk methods, but also an amalgamation of the modern teaching aids like power point presentation, audiovisual teaching etc.

Teaching and Learning Methodologies

- The use of modern teaching aids like LCD projectors, Wi-Fi enabled laptops are usually employed in classrooms and other student learning environments.
- Department encourages academic discussions between faculty and students using black board and faculty members share academic study material using Moodle, Whatsapp groups and their own blogs.
- Department has introduced mini projects in the curriculum. Usage of Role play, Model Demo, Charts etc., during teaching learning process.
- A team of faculty members for analytical subjects and also GATE coaching is provided to the interested and merit students.
- Expert video subject lectures delivered by the various eminent resource persons are available in the digital library and it facilitates the faculty and students to utilize E- Tutorials of NPTEL, MOOCs & access to E-Journals etc.
- Faculty members use department library, digital library and other Open Source platforms to enhance their teaching skills.

- The faculty members are encouraged to participate in short term courses, Faculty development programs and workshops on advanced topics to keep pace with the advanced level of knowledge and skills. Over the past years the faculties have been participating /presenting papers in national/international conferences and publish their articles in national/international journals to enrich their knowledge.
- The faculty members are encouraged to use online teaching tools Microsoft Teams, Zoom, Go To Meeting, google classroom and white board Apps for giving online lectures and assignments.

Online Certifications

- The college has set a good culture from inception by encouraging faculty members to do online certifications. Faculty are also encouraged to go undergo online certifications like NPTEL, Coursera etc. to update their knowledge that in turn helps them in teaching better.

| S.No | Name of the faculty | Name of the certification Course | Organized by | Remarks |
|------|---------------------|---|--------------|--------------|
| 1 | Dr. P. Lakshmanan | Big Data Analytics For Smart Grid | SWAYAM ARPIT | March, 2021 |
| | | Introduction to smart grid | NPTEL | Nov, 2019 |
| | | Python Data Structures | COURSERA | May, 2020 |
| | | Programming for Everybody | COURSERA | April, 2020 |
| | | Electric Cars:Technology | EDX | May, 2020 |
| 2 | Sk.Md.Shareef | Accrediation for Undergraduate Engineering Programmes | SWAYAM | August, 2021 |
| | | Electrical Power Systems | COURSERA | April, 2020 |
| | | Energy - The Enterprise | COURSERA | May, 2020 |
| | | Natural Gas | COURSERA | May, 2020 |
| | | Safety in the Utility Industry | COURSERA | May, 2020 |
| | | Programming for Everybody | COURSERA | April, 2020 |
| | | Enhancing Soft Skills and Personality | NPTEL | April, 2020 |
| 3 | P.D.V.S.K.Kishore | NATURAL GAS | COURSERA | May, 2020 |
| | | SAFETY IN THE UTILITY INDUSTRY | COURSERA | May, 2020 |
| | | ELECTRIC POWER SYSTEMS | COURSERA | April, 2020 |
| | | AI FOR EVERY ONE | COURSERA | April, 2020 |
| | | User Experience Design – Creating User Profiles | COURSERA | May, 2020 |

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|---|----------------------|--|----------|-------------|
| | | ENERGY:THE ENTERPRISE | COURSERA | April, 2020 |
| | | Recent Advances in Transmission Insulator | NPTEL | Feb, 2020 |
| 4 | Mr. J. Sunil Babu | Introduction to smart grid | NPTEL | Nov, 2019 |
| | | Building basic Relational Database In SQL Server Management Studio | COURSERA | May, 2020 |
| | | SAFETY IN THE UTILITY INDUSTRY | COURSERA | April, 2020 |
| | | ENERGY : THE ENTERPRISE | COURSERA | May, 2020 |
| | | ELECTRICAL POWER SYSTEMS | COURSERA | April, 2020 |
| | | AI FOR EVERY ONE | COURSERA | May, 2020 |
| | | INTRODUCTION OF ENVIRONMENTALN LAW AND POLICY | COURSERA | May, 2020 |
| | | NATURAL GAS | COURSERA | May, 2020 |
| 5 | Mr.G.Nagaraju | SAFETY IN THE UTILITY INDUSTRY | COURSERA | April, 2020 |
| | | ENERGY : THE ENTERPRISE | COURSERA | May, 2020 |
| | | ELECTRICAL POWER SYSTEMS | COURSERA | April, 2020 |
| | | AI FOR EVERY ONE | COURSERA | May, 2020 |
| | | NATURAL GAS | COURSERA | May, 2020 |
| | | Fundamentals of Electrical Engineering | NPTEL | Nov, 2019 |
| 6 | Mr.M. Chandra Sekhar | Programming for every body | COURSERA | April, 2020 |
| | | Personal & Family Finanacial Planning | COURSERA | May, 2020 |
| | | Block chain Technology | COURSERA | May, 2020 |
| 7 | Mr.B.Praveen Kumar | Building basic Relational Database In SQL Server Management Studio | COURSERA | May, 2020 |
| | | User Experience Design – Creating User Profiles | COURSERA | May, 2020 |
| | | ELECTRICAL POWER SYSTEMS | COURSERA | April, 2020 |
| | | INTRODUCTION OF ENVIRONMENTALN LAW AND POLICY | COURSERA | May, 2020 |
| | | ENERGY : THE ENTERPRISE | COURSERA | May, 2020 |
| | | ELECTRICAL POWER SYSTEMS | COURSERA | April, 2020 |
| | | AI FOR EVERY ONE | COURSERA | May, 2020 |
| | | Recent Advances in Transmission Insulator | NPTEL | Feb, 2020 |

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|----|-------------------|---|----------|-------------|
| 8 | Mr.G.Naveen | Python Basics | COURSERA | May, 2020 |
| | | Programming For Everybody | COURSERA | April, 2020 |
| | | AI FOR EVERY ONE | COURSERA | May, 2020 |
| | | Electric Power Systems | COURSERA | April, 2020 |
| | | User Experience Design-Creating User Profiles | COURSERA | May, 2020 |
| | | Design Thinking for Innovation | COURSERA | May, 2020 |
| 9 | Mr. SK. Karimulla | Introduction to smart grid | NPTEL | Nov, 2019 |
| | | AI For Every One | COURSERA | May, 2020 |
| | | Electric Power Systems | COURSERA | April, 2020 |
| 10 | M.Subramanyam | AI For Every One | COURSERA | May, 2020 |
| | | Electric Power Systems | COURSERA | April, 2020 |
| | | User Experience Design-Creating User Profiles | COURSERA | May, 2020 |

Table 5.6.1 Innovative Teaching aids

| S. No. | Item | Description |
|--------|--------|---|
| 1 | Moodle | <p>Moodle is a learning platform designed to provide educators, administrators and learners with a single robust, secure and integrated system to create personalized learning environments.</p> <p>The features of moodle are</p> <ul style="list-style-type: none"> • All-in-one learning platform As Moodle provides the most flexible tool-set to support both blended learning and 100% online courses, it can easily integrate everything needed for a course using its complete range of built-in features, including external collaborative tools such as forums, wikis, chats and blogs. Through moodle, course materials are delivered to students, Quizzes are conducted, assignments are given and grading is done accordingly. It is n effective tool for effective teaching learning process and is being extensively used in our department. • Highly flexible and fully customizable Because it is open-source, Moodle can be customized in any way and tailored to individual needs. Its modular set up and interoperable design allows developers to create plugins and integrate external applications to achieve specific functionalities. Hence the Faculty has got the freedom to use moodle effectively for enhanced teaching learning. • Robust, secure and private As data security and user privacy, security controls are constantly being updated and implemented in Moodle development processes against unauthorized access, data loss and misuse, moodle provides an easy platform for continuous assessment of students. Moodle can be easily deployed on a private secure cloud or server for complete control. • Use any time, anywhere, on any device Moodle is web-based and so can be accessed from anywhere in the world. With a default mobile- compatible interface and cross-browser compatibility, content on the Moodle platform is easily accessible and consistent across different web browsers and devices. This gives a 24x7 learning experience for the users. |

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| | | <ul style="list-style-type: none"> • Extensive resources available Access extensive Moodle documentation and user forums in multiple languages, free content and courses shared by Moodle users across the world, as well as hundreds of plugins contributed by a large global community. |
| 2 | Virtual Labs | Engineering Education is incomplete without hands on learning of real systems. IIT Kharagpur having a very strong base in Theory of Engineering Systems has developed a large amount of lecture material which is disseminated through the National Programme on Technology Enhanced Learning (NPTEL) in the form of Video or Web based content for each theory course in Engineering Sciences. NPTEL facilitates the Information and Communications technology (ICT) based distribution to a large audience in the world the lecture materials using the Internet as a medium. |
| 3 | MOOCS (NPTEL, Coursera, Udemy etc) | <p>Massive Open Online Courses (MOOCs) are free online courses available for anyone to enroll. MOOCs provide an affordable and flexible way to learn new skills, advance your career and deliver quality educational experiences at scale.</p> <p>Millions of people around the world use MOOCs to learn for a variety of reasons, including: career development, changing careers, college preparations, supplemental learning, lifelong learning, corporate eLearning & training, and more.</p> <p>Faculty members are motivated to students to take up online courses for their subjects from various eminent platforms like NPTEL, Coursera, Edex,.</p> <p>NPTEL: The main objective of the National Program on Technology Enhanced Learning (NPTEL) is to enhance the quality of engineering and science education in the country by developing content for undergraduate and postgraduate curricula using video and web-based courses. These courses cover the syllabi prescribed by universities and approved by AICTE.</p> <p>NPTEL Local Chapter: Our college is having NPTEL Local Chapter: It is a partnership between the college and NPTEL. Many students and faculty members in the department enroll for courses and get certified after the successful completion of the course.</p> <p>Coursera:</p> |

| | | |
|---|------------------------|--|
| | | <p>Many faculty members and students in the department have completed online courses based upon their area of interest. These courses also help the faculty to advance their skills for career development.</p> <p>https://www.coursera.org/</p> |
| 4 | Project Based Learning | <p>Project Based Learning is a teaching method in which students gain knowledge and skills by working for an extended period of time to investigate and respond to an authentic, engaging, and complex question, problem, or challenge. Students work on a project over an extended period of time – from a week up to a semester – that engages them in solving a real-world problem or answering a complex question. They demonstrate their knowledge and skills by developing a public product or presentation. As a result, students develop deep content knowledge as well as critical thinking, creativity, and communication skills in the context of doing an authentic, meaningful project. Project Based Learning unleashes a contagious, creative energy among students and teachers.</p> <p>The department has made it a mandatory requirement for every student to design and conduct a project, right from the fifth semester onwards which is beyond the regular curriculum for the semester. This helps the student to have a hands-on approach to the engineering design process and utilize the theoretical aspects they have learnt to develop prototypes and design experiments on what they have learnt.</p> <ul style="list-style-type: none"> • During the fifth semester, the students conduct a mini-project that focuses on the fundamental software design aspects of computer Science and Engineering. A project group consisting of a maximum of four members under the guidance of a faculty member explores a scientific principle related to their area of interest. The learning process is given more weightage during the assessment and not the results obtained. • Students in their sixth semester are encouraged to do a project which will help them to learn new technical skills with guidance from an allotted faculty member. They are encouraged to explore a problem and develop a simple prototype or working model that can solve it. This introduces them to the concept of the Engineering design process method. <p>The group of students is also mentored by their allotted guides in preparing a well-structured report. To assist this process, the institution has published a scientific format in which each project group is required to submit the report. This practice helps the students to understand and improve their scientific writing skills. The prepared report is archived in both soft and hard copy and is made available in the department library for peer reference.</p> |

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| 5 | Flipped Classroom | A flipped classroom is an instructional strategy and a type of blended learning that reverses the traditional learning environment by delivering instructional content, often online, outside of the classroom. It moves activities, including those that may have traditionally been considered homework, into the classroom |
| 6 | Think-Pair-Share | <p>It helps students to think individually about a topic or answer to a question. It teaches students to share ideas with classmates and builds oral communication skills. It helps focus attention and engage students in comprehending the reading material. The Procedure to use this method is</p> <ul style="list-style-type: none"> • Decide upon the text to be read and develop the set of questions or prompts that target key content concepts. • Describe the purpose of the strategy and provide guidelines for discussions. • Model the procedure to ensure that students understand how to use the strategy. <p>Monitor and support students as they work through the following:</p> <p>T: (Think) Teachers begin by asking a specific question about the text. Students "think" about what they know or have learned about the topic.</p> <p>P: (Pair) Each student should be paired with another student or a small group.</p> <p>S: (Share) Students share their thinking with their partner. Teachers expand the "share" into a whole-class discussion.</p> |

Alumni Interaction:

In NEC, we have Alumni Association in which every year all the alumnis will have get together. Alumni will interact with their juniors and give them guidance to have betterment in their academics as well as the opportunities in advanced technologies and also path for higher studies.

Some glimpses of the Alumni Interaction



Figure 5.6.1: Alumni talk by SK.Sharukh (Batch: 2019-2022) shared his experience in TOSHIBA Transformers as an Engineering Assistant to IV B.Tech,EEE Students on 09-02-2023.

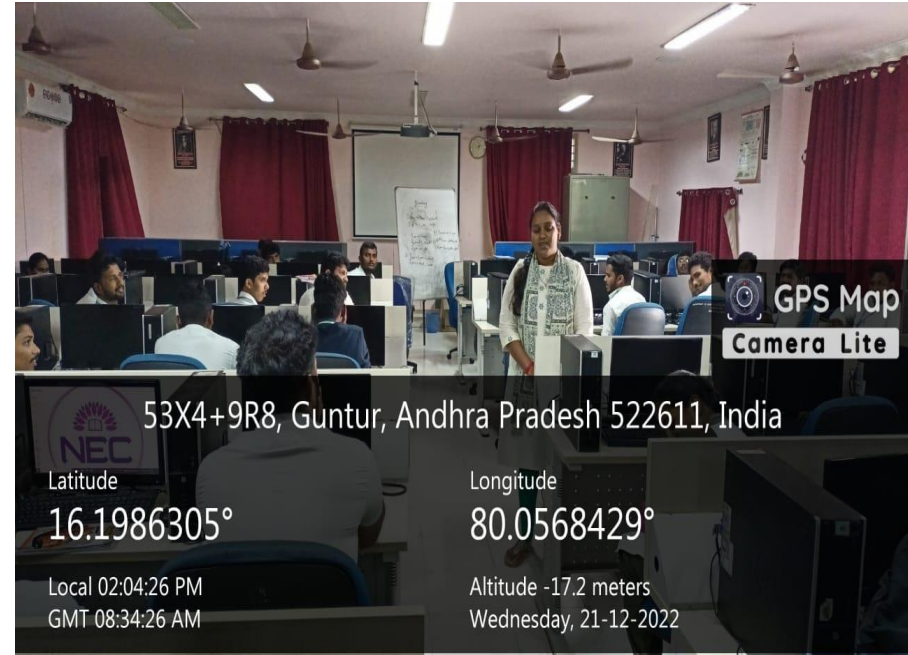



Figure 5.6.2: Alumni talk by CH. Haritha (2013-2017). Present she is working in TCS, now she is planning to abroad. She chats with the IV EEE students regarding how to get admission in USA and scholarship


NARASARAOPETA ENGINEERING COLLEGE
 (AUTONOMOUS)

ALUMNI TALK
ELECTRICAL VECHILE DESIGN

by
Mr. Ashoka Chakravarthi. K
 (B.Tech EEE Batch 2004-08)
Chief Technical Officer (CTO)
 Charge House, Hyderabad

28.01.2023
 11:30 AM

Organized by
 Department of Electrical and Electronics Engineering



Figure 5.6.2: Mr. K Ashok Chakravarthi - EEE. (2004-2008) CTO, Charge House, Hyd, has delivered a technical talk on Applications of Charge controllers in Electrical Vehicles to IV B.Tech Students on 28-01-2023.

Table 5.6.2 Innovative Teaching by Activity Based Teaching

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|--------------------------------|-------------------------------|--|
| Activity Based Teaching | Collaborative Learning | It involves encouraging student collaboration for various projects. We live in a globalized world and collaboration is an essential life skill that is important for all careers and enterprises. Teachers can help foster this skill in the classroom by allowing students to learn, study and work in groups. |
| | Flipped Class Room | It involves encouraging student for presentation of different concepts from the syllabus as a part of revision. Flipping the classroom is an effective teaching method. In this technique, the students are made active participants of the learning process by passing the onus of learning on them, it requires the teachers to relegate to the role of resource providers and the students take the responsibility of gathering concepts information. Using various tools of technology the students are encouraged to constructing knowledge, fill in the information gaps and make inferences on their own as and when needed |
| | Group discussions | To make students develop communication skills |
| | Seminars | To make students develop communication skills and reduce the stage fear in them. |
| | Blended Learning | It is a style of training in which students learn via electronic and online mode as well as traditional face to face training. |
| | Social Responsibility | To inculcate the social responsibility by participating students in NSS programmes |
| | Role Play | The results reveal that participants are more enthusiastic to engage in class activities. They also develop social and communication skills through group activities associated with the teaching of ADA. Role play can be a very useful strategy to teach concepts that are perceived as abstract. |
| | Learning by Doing | Student can learn the skills and apply in the laboratory in presence of the faculty. |
| | Mind Map | For better understanding and learning of concepts, new technology provides various tools . Students understand how using digital technology tools could help in boosting task efficiency. By using new tools and technology like hive for extracting important insights from huge data in no time can benefit the user in many ways. |

Collaborative Learning



Figure 5.6.3: Collaborative Learning

Technical Seminars:

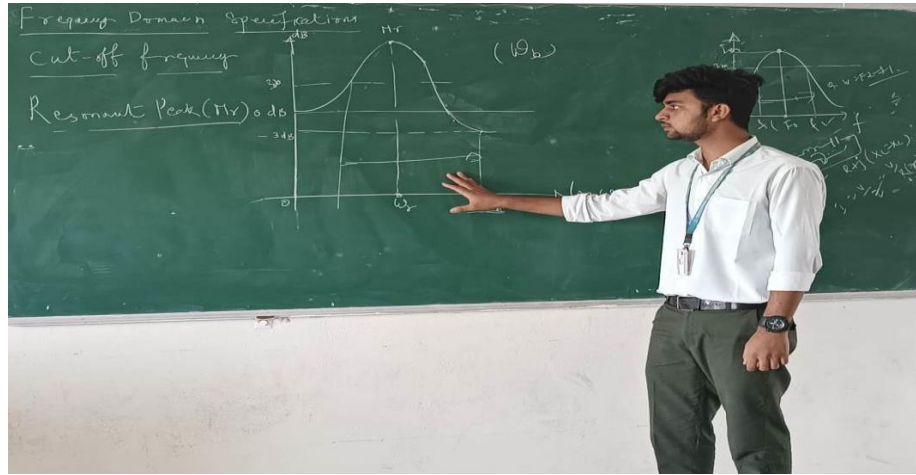


Figure 5.6.4: Technical Seminars

Project based Learning:

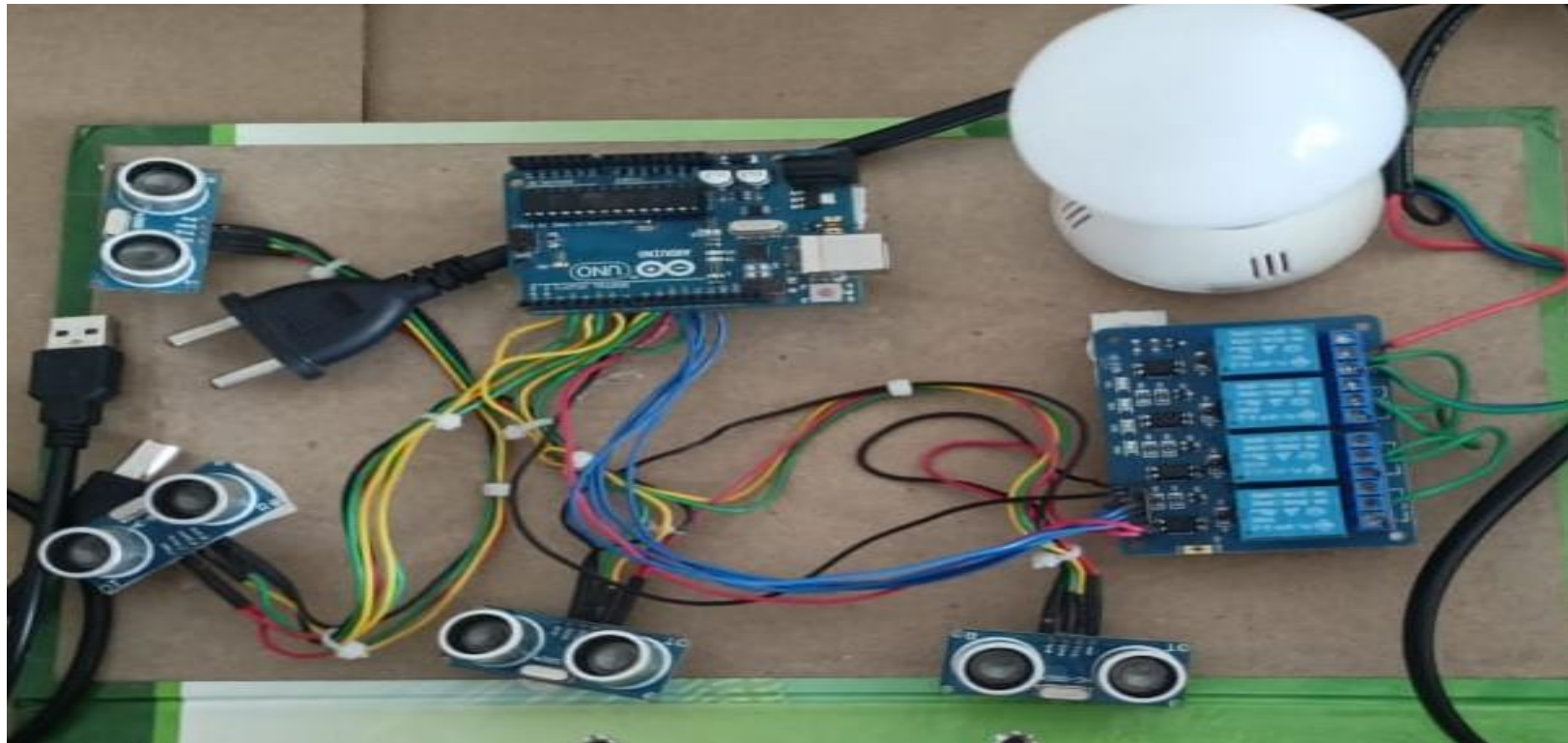


Figure 5.6.5: Touchless Switchboard for Post Covid World by using Arduino & Relays.

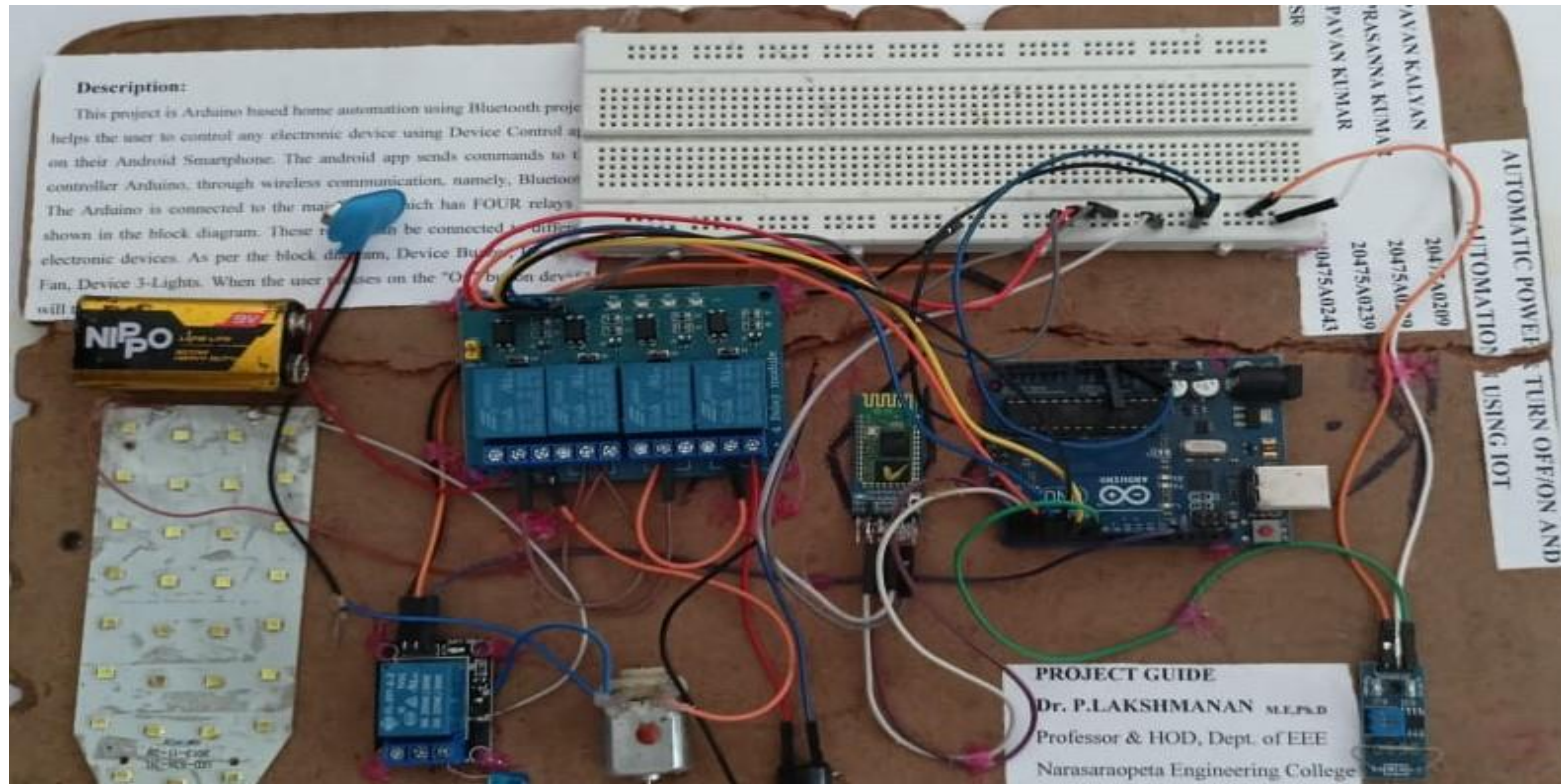


Figure 5.6.6: Automatic Power Turn off and Home Automation.

