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BVRIT H
Estd. 2012

BVRIT HYDERABAD College of Engineering for Women
Department of Electronics and Communication Engineering

Name of the Activity: Mind Map Preparation on Charts

Faculty Name: Dr. Anwar Bhasha Pattan

Class: II – I / ECE –B

Academic Year: 2024-25

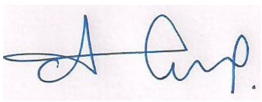
Subject Name: Digital Logic Design

Topic: Combinational and Sequential Circuits

Brief Write - Up

This group activity is to summarize the concepts of combinational and sequential logic design to create overall understanding of the topic. In this activity students have to draw a mind map or tree structure depicting the topics related to each other on a chart. This will enable the students to understand the connectivity that helps in synthesis of digital circuits

Photos:



Faculty Sign

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Estd. 2012

BVRIT HYDERABAD College of Engineering for Women
Department of Electronics and Communication Engineering

Name of the Activity: Learning by Design

Faculty Name: Dr. Anwar Bhasha Pattan

Class: II – I / ECE –B

Academic Year: 2024-25

Subject Name: Digital Logic Design

Topic: Combinational Circuits

Brief Write - Up

This is a team activity where the students are teamed up and design a combinational circuit with given specifications. The questions are not direct and test their analytical and reasoning skills. This activity ignites their thinking and problem solving skills. The students participated enthusiastically and designed the circuits. This enhances the creativity and collaboration among the students.

Photos:

Faculty Sign

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Department of Electronics and Communication Engineering

Activity: System Response to Input Signals
Faculty Name: Dr. V. Santhosh Kumar
Class / Semester: II/I ECE B
Academic Year: 2024-25
Subject Name: S S
Description:
This activity focuses on analyzing how linear time-invariant (LTI) systems respond to different types of input signals. The goal is to help students understand the fundamental behavior of systems in both time and frequency domains using theoretical and simulation-based approaches.
Students will explore system responses to standard test signals such as:
Impulse Signal (δ[n]), Step Signal (u[n]), Sinusoidal Signal, Exponential Signal

The analysis includes:
Convolution operation to determine output in the time domain.
Use of system properties like linearity, time-invariance, and causality.
Frequency response using Fourier and Laplace/Z-transforms where applicable.
Stability and causality checks.

Practical implementation may involve MATLAB, or simulation tools to visualize the output signal and validate theoretical predictions.

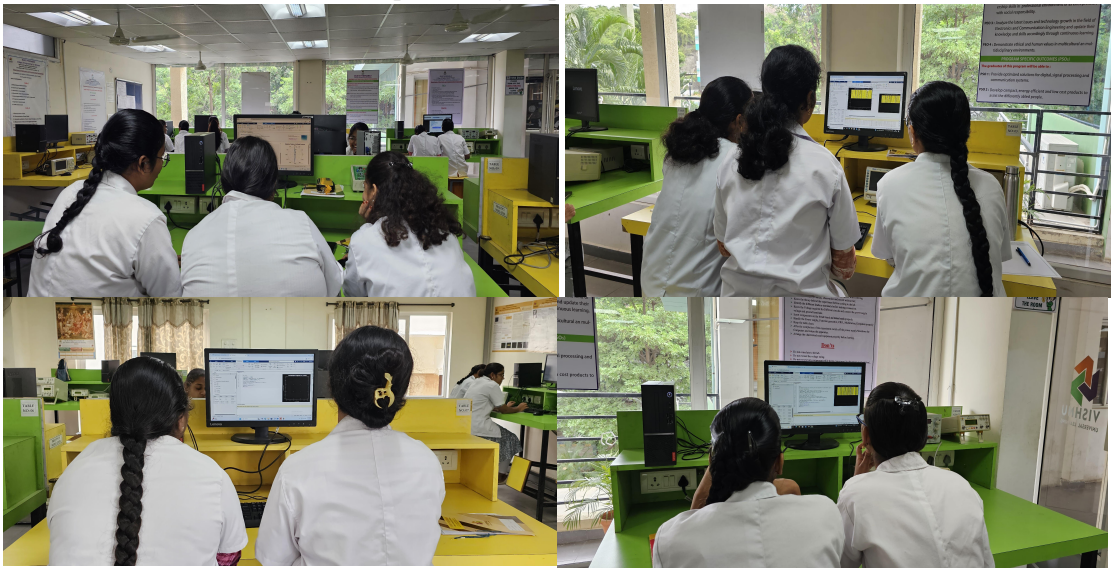
By completing this activity, students will:
Understand how different systems respond to a range of input signals.
Gain proficiency in using convolution and transform techniques.
Relate time-domain and frequency-domain characteristics of systems.
This activity builds the foundation for analyzing filters, control systems, and signal processing applications.


Number of students involved: 65
Date of the activity: 2 0 / 0 9 / 2 0 2 4
For any Queries, please contact: santhosh.v@bvrithyderabad.edu.in

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Name of the Activity: Signal Classification and Visualization
Faculty Name: Dr. V. Santhosh Kumar
Class/Semester: II/I ECE B
Academic Year: 2024-25
Subject Name: S S
Objective:
Enhance students' conceptual understanding of various types of signals—such as periodic, aperiodic, even, and odd—through hands-on classification and visualization exercises.
Description:
This activity is designed to help students develop a deeper understanding of signal types through classification and visualization. By working with real-world signal datasets in MATLAB, students learn to identify and distinguish between periodic and aperiodic signals, as well as even and odd signals, based on their mathematical properties and graphical representations. Students are grouped into teams of four to encourage collaborative learning. Each group is tasked with analyzing signals using definitions discussed in class, plotting them in MATLAB, and engaging in group discussions to justify their classification. This hands-on experience enhances both conceptual clarity and practical skills in signal analysis. Through this activity, students strengthen their ability to visually interpret and mathematically classify signals, setting a solid foundation for further studies in signal processing and systems theory.
Activity Setup:
Students were organized into groups of four, promoting teamwork and peer discussion. Each group was provided with MATLAB access and a collection of real-world signal datasets.
Learning Outcomes:
Understand and distinguish between periodic, aperiodic, even, and odd signals.
Apply MATLAB to visualize and analyze signal properties.
Strengthen reasoning and communication skills through collaborative discussion.
Build a foundation for advanced topics in signal processing.



Number of students involved: 60
Date of the activity: 08/09/2024
For any Queries, please contact: santhosh.v@bvrithyderabad.edu.in

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Department of Electronics and Communication Engineering

Name of the Activity: Applications of Diode – Chart activity

Faculty Name: MS. Rajidi Sahithi

Class / Semester: I/I CSE A & B

Academic Year: 2024-25

Subject Name: Electronic Devices and Circuits

Objectives of the Activity:

- To enhance students' understanding of Diode Applications.
- To foster collaborative learning and teamwork among students.
- To develop students' skills in presenting technical information visually.

Description of the Activity:

The chart preparation activity focused on the Applications of Diode. Students were divided into groups of four and tasked with creating detailed charts on various topics related to Diode applications, such as clippers, clampers, Regulators.

Materials/Resources Used:

- Chart papers
- Markers, pens, and pencils
- Reference books and online resources on Digital Electronic Circuits
- Printed handouts with guidelines and example diagrams

Outcome/Feedback:

- **Students' Performance**: All groups successfully completed their charts, demonstrating a good understanding of their assigned topics. The charts were visually appealing and contained accurate information.
- **Teamwork and Collaboration**: The activity promoted teamwork, as students collaborated effectively within their groups.
- **Feedback from Instructors**: The instructors provided positive feedback on the students' work, noting improvements in their comprehension and presentation skills.
- **Students' Feedback**: Students found the activity engaging and informative. They appreciated the hands-on approach to learning and the opportunity to work in teams.

No. of Students Participated: 64

Date: 01-January-2025

For any queries, please contact to below mail: sahithi.r@bvrithyderabad.edu.in

Sahithi

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Chart Preparation on Digital Electronic Circuits

Faculty Name: Dr.V.Hindumathi

Class / Semester: II / I / CSE-A & IT-B

Academic Year: 2024-25

Subject Name: Digital Electronics

Topic: Design of Combinational circuits

Date: 14-11-2024

Number of Students Participated: 65

Brief Write - Up

As part of an engaging and collaborative learning initiative, a chart preparation activity was organized focusing on the key concepts and components of Digital Electronic Circuits. This hands-on activity aimed to enhance students' understanding through visual representation and teamwork.

Students were divided into groups of four to encourage peer learning, communication, and cooperation. Each group was assigned a specific topic under the broad domain of Digital Electronics, such as logic gates, flip-flops, multiplexers, demultiplexers, encoders, decoders, and counters. The topics were chosen to cover both fundamental and advanced components of digital circuit design.

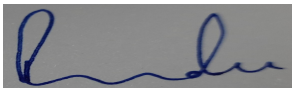
This activity not only reinforced the theoretical knowledge but also developed essential skills like presentation, creativity, teamwork, and technical articulation. Additionally, it helped students gain a stronger conceptual grasp of how digital components function and interact within larger electronic systems.

Overall, the chart preparation activity proved to be an effective pedagogical tool in making digital electronics both understandable and enjoyable for the students.

- **Objective:**
- To enhance students' understanding of Digital Electronic Circuits.
- To foster collaborative learning and teamwork among students.
- To develop students' skills in presenting technical information visually

Photos:

For any Queries contact: hindumathi.v@bvrithyderabad.edu.in



(Dr.V.Hindumathi)

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Department of Electronics and Communication Engineering

Name of the Activity: Learning by Doing and Discussion

Faculty Name: Ms. M. Praveena
Class / Semester: II/I IT
Academic Year: 2024-25
Subject Name: Digital Electronics
Topic: Unit II (Design of combinational circuits)

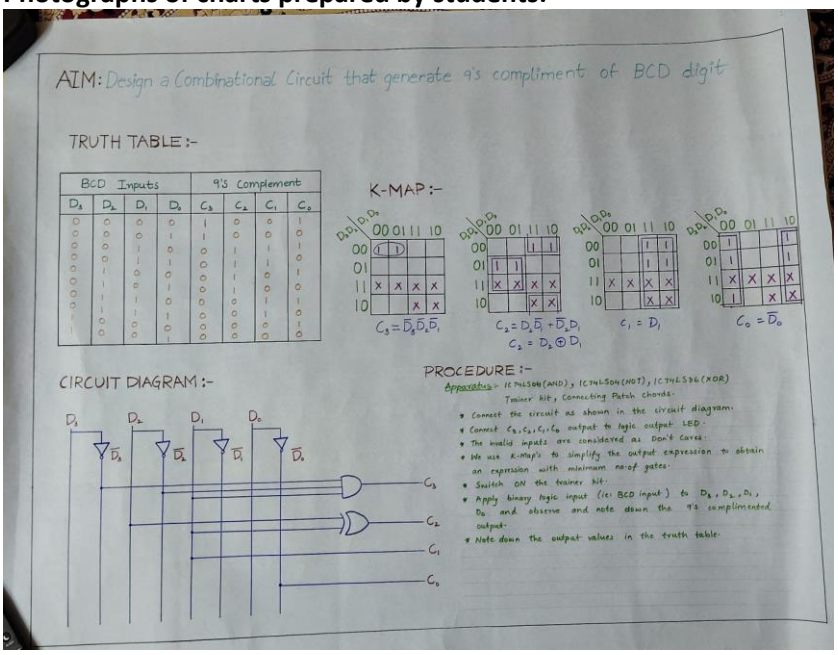
No. of students participated: 63

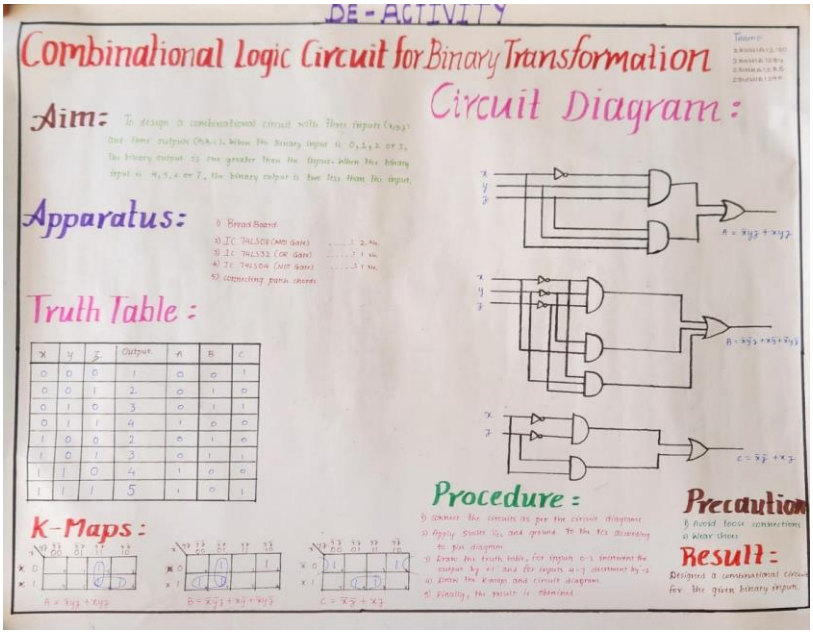
Brief Write-up (Not exceeding 200 Words)

This is a group activity wherein students confer among themselves over a concept and prepare a chart on which they were asked to give their views. This is in turn passed on to next group who will study the first group representation of the concept and add either question marks over the representation which require clarity or put a cross mark over the representation which are wrongly interpreted. Like this the paper will be passed on to all the groups and finally the first group receives its paper and then they need to give justifications to all the representations done by them, answer all the question marks and correct all their mistakes.

Objective:
This gives a wide range of scope to the students to discuss with their peers regarding the concepts and help them in better understanding the concepts because of these discussions in peer group and identifying the mistakes done by other peers.

Photographs of charts prepared by students:





For any queries, please contact to below mail: praveena.m@bvrithyderabad.edu.in

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Department of Electronics and Communication Engineering

Name of the Activity: Techno Crossword

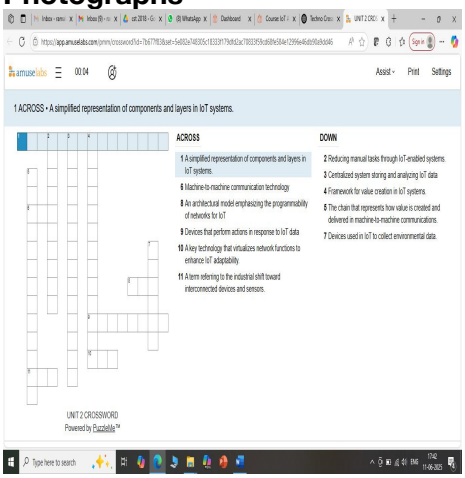
Faculty Name: Ms. Rama Lakshmi G
Class / Semester: III/II ECE A
Academic Year: 2023-24
Subject Name: IoT A&P
Topic: Protocols
Student Participated: 52

Brief Write-up (Not exceeding 200 Words)

The Techno Crossword is a gamified learning activity where participants solve a crossword puzzle filled with terms related to technology, engineering, and innovation. This activity encourages students to recall definitions, applications, and abbreviations commonly used in their field of study (e.g., IoT, AI, Electronics, Programming, Cybersecurity, etc.).
Participants work individually or in teams to complete the crossword based on a set of clues — either definitions, use-cases, or technical synonyms. It promotes critical thinking, teamwork, vocabulary building, and content retention in a fun, low-pressure environment.

Objective:
To reinforce key technical terms and concepts through an engaging and collaborative puzzle-solving activity.

Photographs



For any queries, please contact to below mail: ramalakshmi.g@bvrithyderabad.edu.in

BVRIT HYDERABAD College of Engineering for Women
Department of Electronics and Communication Engineering

Name of the Activity: Application oriented Project

Faculty Name: Ms. Rama Lakshmi G
Class / Semester: III/I ECE A
Academic Year: 2023-24
Subject Name: IoT A&P
Topic: Protocols
Student participated: 51

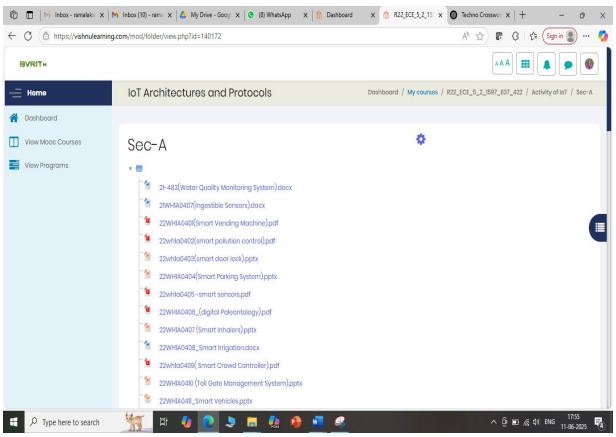
Brief Write-up

This project-based activity involves designing a complete IoT application (e.g., Smart Home, Smart Agriculture, Health Monitoring) that integrates sensors, microcontrollers, communication modules, and cloud platforms. Students will implement various layers of the IoT protocol stack—starting from device communication (physical and link layer) to data transmission (network, transport), and application layer protocols (like MQTT, CoAP, HTTP).
Students will:

- Select a real-world problem and define the IoT use case.
- Interface sensors/actuators with microcontrollers (e.g., Arduino, ESP32).
- Implement data transmission using suitable protocols (e.g., MQTT, CoAP).
- Store and visualize data using platforms like ThingSpeak, Blynk, or Firebase.
- Ensure basic security practices like token authentication or encryption.

Objective:
To provide students with hands-on experience in developing an IoT system by applying various IoT communication protocols and understanding the complete architecture from sensing to cloud integration.

Photographs



For any queries, please contact to below mail: ramalakshmi.g@bvrithyderabad.edu.in

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Department of Electronics and Communication Engineering

Activity: Lab into Class

Faculty Name: Mr. N.M. Sai Krishna

Class: II – I / ECE – A & B

Academic Year: 2024–25

Subject Name:

Analog Circuits

Topic: Clippers

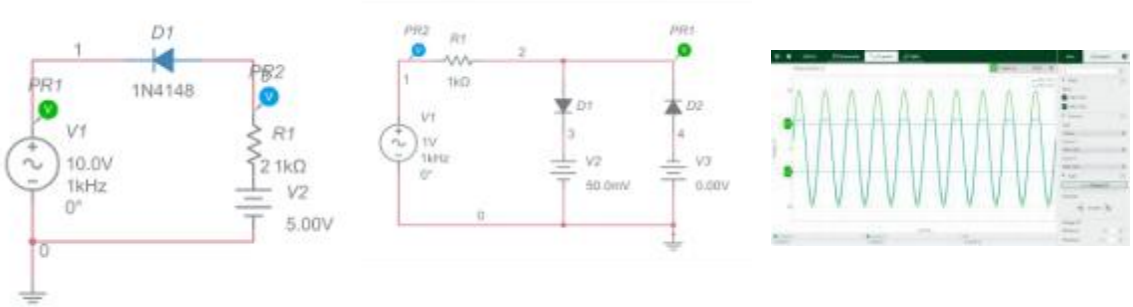
Date: 23-12-2024

Brief Write-Up

The Lab into Class activity on **Clippers** focused on bridging theoretical understanding with practical implementation of wave-shaping circuits. Students explored the design and behavior of various clippers, including series and shunt configurations using diodes. They examined how clippers can be used to remove or "clip" parts of input waveforms above or below certain voltage levels.

Students analyzed input-output waveform characteristics and interpreted the effect of bias voltages and diode orientation. Circuit performance was verified using breadboards and oscilloscopes to validate expected results.

Photo(s):



Impact:

This hands-on activity helped students consolidate their theoretical understanding of waveform shaping through clippers. It improved their analytical thinking and problem-solving skills, as they gained exposure to both ideal and practical diode behavior. The experience fostered better engagement, increased confidence, and readiness to apply these concepts in real-world circuit design challenges.

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Plan and Prototype

Faculty Name: Mr.N.M.Sai Krishna

Class: II - I / ECE - A & B

Academic Year: 2024-25

Subject Name: Analog Circuits

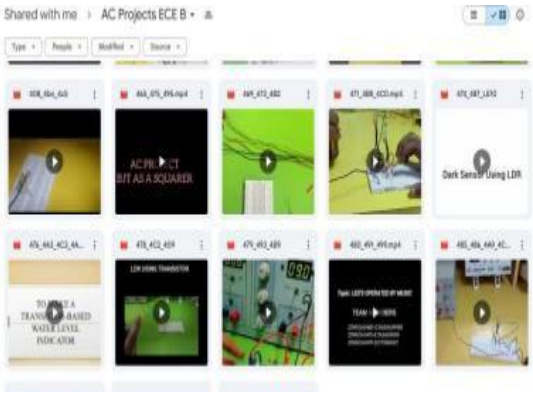
Topic: Transistor applications

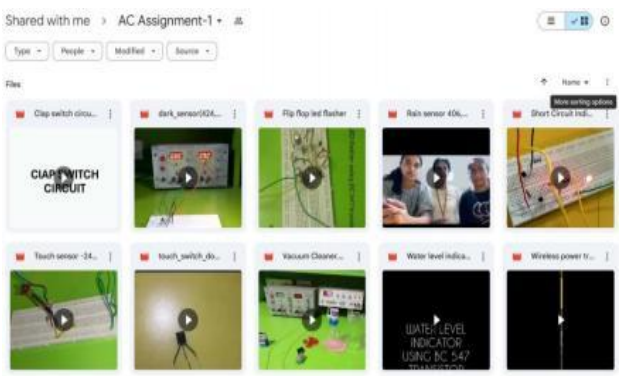
Date: 12-09-24

Brief Write - Up

The Plan & Prototype activity focused on exploring the applications of transistors through hands -on experimentation and design. Participants began by understanding transistor functionalities, including amplification, switching, and signal modulation. Teams then selected real-world applications such as amplifiers, logic gates, or sensor circuits and designed prototypes using transistors. The process involved circuit simulation, hardware implementation, and testing for optimization. Through iterative improvements, participants enhanced efficiency and functionality. This activity reinforced practical knowledge of transistor-based circuits

Photo(s):





CO	Program Outcomes (PO) and Program Specific Outcomes (PSO)													
	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	3	2	-	-	-	-	-	-	-	1	3	2
CO2	3	3	3	3	-	-	-	-	-	-	-	1	3	2
CO3	3	3	3	3	-	-	-	-	-	-	-	1	3	2
CO4	3	2	3	1	-	-	-	-	-	-	-	1	3	2
CO5	3	3	3	3	-	-	-	-	-	-	-	1	3	2
CO6	3	2	3	2	-	-	-	-	-	-	-	1	3	2

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Department of Electronics and Communication Engineering

Name of the Activity: Chart preparation

Faculty Name: T. Amy Prasanna
Class / Semester: I CSE-AIML
Academic Year: 2024-25
Subject Name: Electronic Devices and circuits
Topic: Unit I (Diodes)

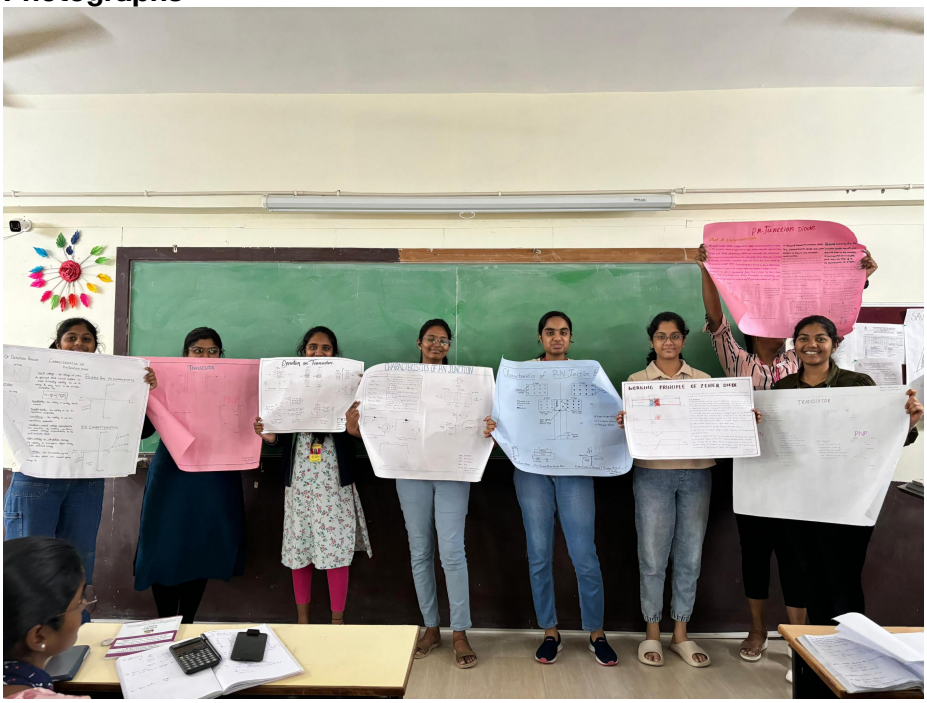
Brief Write-up (Not exceeding 200 Words)

students are divided into groups, They need to make a chart on given topic by collecting required material. This activity makes the students to involve in a team and discuss various concepts with peer and there by enhancing knowledge on those concepts.

Objective:

This gives a wide range of scope to the students to discuss the concepts as a group and help them in better understanding the concepts.

Photographs



For any queries, please contact to below mail: prasanna.tella@bvrithyderabad.edu.in

Amy prasanna

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Department of Electronics and Communication Engineering

Name of the Activity: Group Presentation
Faculty Name: Dr. Mamidi Ranjeeth Class: II – I / EEE
Academic Year: 2024-25
Subject Name: Analog Electronic circuits

Date :13/11/2024

Write-up:
PPT presentations enhanced communication skills and creativity by allowing students to organize ideas visually and present confidently. This interactive activity fostered engagement, critical thinking, and practical presentation skills for future use.
Chart presentations helped students simplify and visualize data effectively. This activity encouraged creativity, teamwork, and precision while building analytical and communication skills valuable in academic and professional contexts.
The virtual lab offered hands-on experimentation in a digital environment, making learning engaging and practical. It encouraged curiosity, problem-solving, and the application of theoretical concepts in a risk-free setting.
Multisim provided a practical platform for circuit design and simulation, bridging theory and application. It developed technical skills, teamwork, and a deeper understanding of electronics, preparing students for real-world challenges.




No. of Students Participated: 70
For any queries, please contact to below mail: ranjeeth.m@bvrithyderabad.edu.in

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Department of Electronics and Communication Engineering

Name of the Activity: Solving Technical Crossword Puzzle with the given clues

Faculty Name: Dr T Thammi Reddy

Class: III – II / ECE –A

Academic Year: 2024-25

Subject Name: Microcontrollers

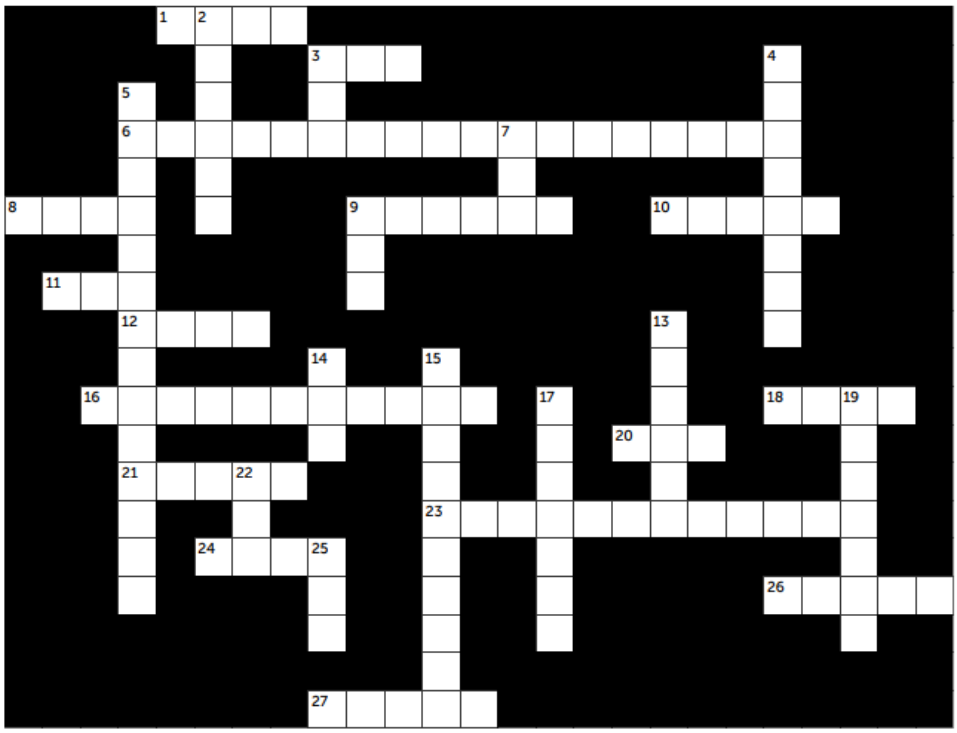
Topic: 8086 Microprocessors

Brief Write –Up: A crossword puzzle using 8086 microprocessors is solved by dividing the class into four batches. The objective was to enhance students' understanding of assembly language programming and problem-solving skills. Each batch was assigned specific clues and implemented solutions using 8086 basics. The activity improved teamwork, logical thinking, and understanding of microprocessor basics. 4-5 student volunteers have conducted the score boarding activity etc.

Date: 1**8-09-2024**

No. of Students Participated: 62

Photos: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Across

1 This instruction of 8086 is used to perform the iteration of certain process to perform for given number of times.

3 Signal used to latch the address from the data bus in the 8086 microprocessor.

6 Tracks the address of the next instruction.

8 RAM in the 8086 is organized into this many segments.

9 A term for a segment of code that modifies the behavior of an instruction.

10 Operation that moves bits to the left or right within a register

11 Instruction used to move to a different part of the code.

12 This instruction repeats until the condition of the zero flag is no longer met or until the count in CL/CX reaches zero.

16 Which type of register is used especially in arithmetic and I/O operations?

18 The 8086 microprocessor falls under which architecture?

20 In the 8086 instruction set, this instruction type is used to move data between registers and memory.

21 Data structure used for storing and managing temporary information in a last-in, first-out manner.

23 Helps with additional data storage during string manipulations.

24 This operation adds an item to the stack.

26 A Memory where elements are processed using First In, First Out (FIFO) principle.

27 This prefix instruction is used to repeat a string operation while the zero flag is not set.

Down

2 The formula for calculating a physical address is: (Segment x 16) + _____

3 This unit processes integer arithmetic and logic tasks in the processor.

4 Which flag is used to compare if two numbers are equal or not in magnitude.

5 The brain of the computer, managing all operations and processing tasks

7 Interrupt type that cannot be ignored by the processor

9 Register that holds the status and control flags in a microprocessor.

13 This term refers to the part of an instruction that specifies the operation to be performed.

14 This pin is used for synchronization of the 8086 with external devices.

15 The 8086 microprocessor uses this architecture, which stores both data and instructions in the same memory.

17 This term describes the variable or constant involved in a 8086 operation.

19 The number of bits that can be transmitted simultaneously through the data bus of the 8086.

22 Another term for the brain of the computer

25 Instruction that stops the processor.

Faculty Sign

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Department of Electronics and Communication Engineering

Name of the Activity: Question the Answers

Faculty Name: Dr T Thammi Reddy

Class: III – II / ECE –A

Academic Year: 2024-25

Subject Name: Microcontrollers

Topic: 8051 Microcontrollers

Brief Write –Up: The "Question the Answer" activity was conducted to enhance students' understanding of 8081 microcontrollers through an interactive and engaging approach. Students were provided with answers related to 8081 concepts such as architecture, memory, registers, timers, and instruction sets, and were tasked with formulating the corresponding questions. This encouraged critical thinking, reinforced key concepts, and promoted collaborative learning. The activity successfully improved conceptual clarity, analytical skills, and student engagement in a fun and effective manner.

Date: 02-12-2024

No. of Students Participated: 65

Photos:

Answer: The 8051 is an 8-bit microcontroller.
Question: What is the data bus width of the 8051 microcontroller?

Answer: The 8051 has 128 bytes of internal RAM.
Question: How much internal RAM is available in the 8051 microcontroller?

Answer: It has four parallel I/O ports.
Question: How many I/O ports are present in the 8051 microcontroller?

Answer: The program memory of 8051 can be up to 64 KB.
Question: What is the maximum program memory that the 8051 microcontroller can support?

Answer: The 8051 has a Harvard architecture.
Question: What type of architecture does the 8051 microcontroller use?

Answer: It has two 16-bit timers/counters.
Question: How many timers/counters are available in the 8051 microcontroller?

Answer: The clock frequency of 8051 is typically 12 MHz.
Question: What is the standard clock frequency of the 8051 microcontroller?

Answer: It supports both serial and parallel communication.
Question: What types of communication does the 8051 microcontroller support?

Answer: The Special Function Registers (SFRs) control various operations of the microcontroller.
Question: What is the purpose of Special Function Registers (SFRs) in the 8051 microcontroller?

Answer: The accumulator (A) is the most commonly used register in the 8051.
Question: Which register is most frequently used for arithmetic and logic operations in the 8051 microcontroller?

TTReddy

Faculty Sign

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Department of Electronics and Communication Engineering

Activity: Classroom Activity

Faculty Name: Dr. L. Bhargava Kumar

Class / Semester: I-I CSE - E & F

Academic Year: 2024-25

Subject Name: EDC

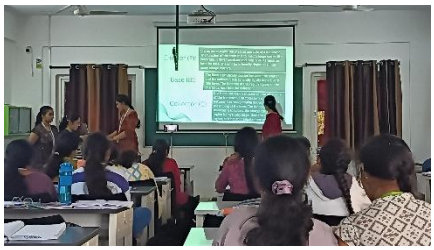
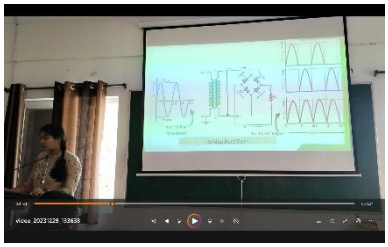
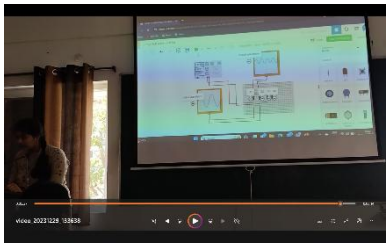
Topic: Unit - I, II, III Topics

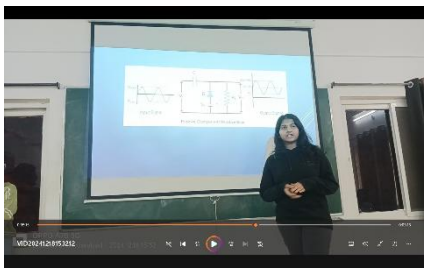
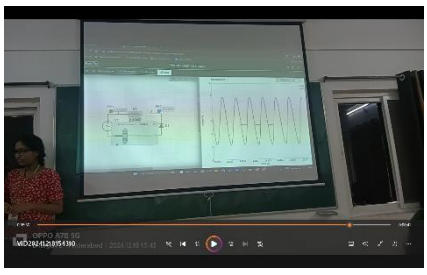
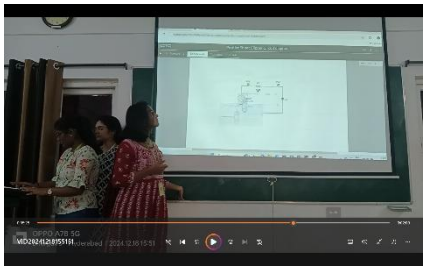
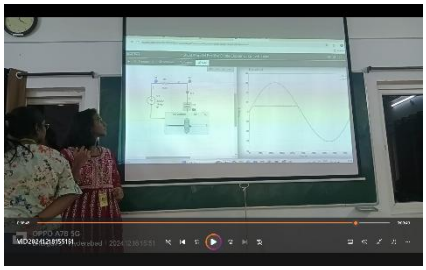
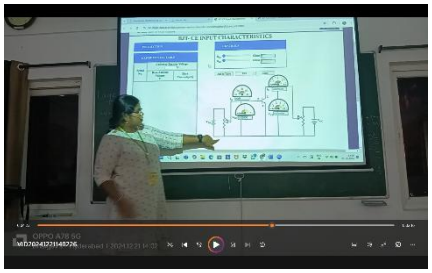
Brief Write – Conducted classroom activity for I B.Tech I Semester students on EDC subject on various dates during the semester. All the students from each class participated in these activities. The students teams are formed (4 in a team) and have chosen their interested topic for the classroom activity. The activity includes a presentation or explanation of the topic for few minutes and followed by a presentation of doing the experiment using the virtual lab or Multisim or Tinker CAD or LT Spice or MATLAB online software.

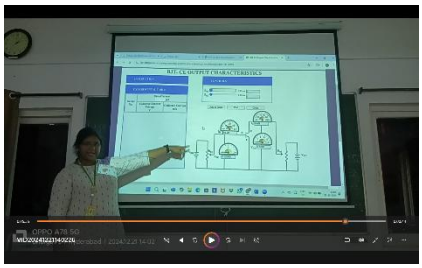
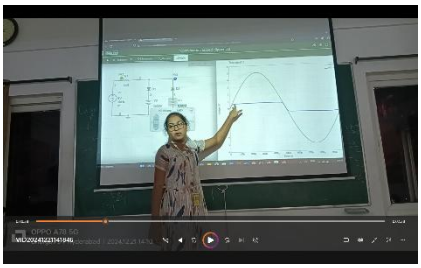
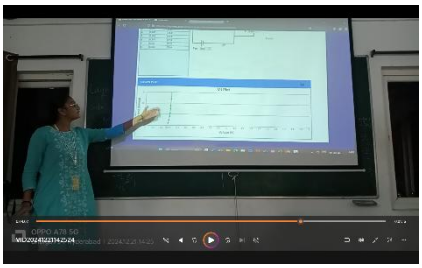
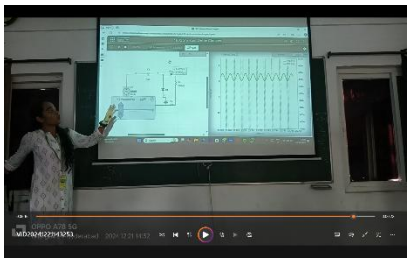
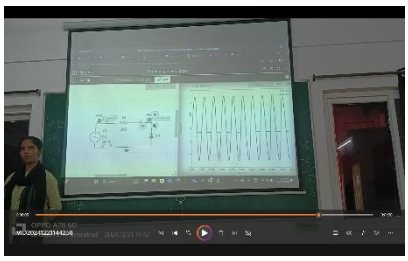
Objective: Conducting these activities for the students in this subject

i) Evaluate students' **grasp of fundamental concepts** such as operation of the devices through their characteristics, etc.
ii) Identify **conceptual gaps or misconceptions** early in the learning process.
iii) Make learning more **interactive and engaging**, breaking the monotony of lectures.
iv) Provide quick insights into performance so that students can **self-correct and reflect** on their understanding.
v) Understand the topics from the practical views.

Photos:


For any Queries contact: bhargavakumar.l@bvrithyderabad.edu.in

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Estd. 2012

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Lab Activity

Faculty Name: Dr. L. Bhargava Kumar

Class / Semester: I-I CSE - E & F

Academic Year: 2024-25

Subject Name: EDC

Topic: Unit – III & Unit - IV Topics

Brief Write – Conducted lab activity for I B.Tech I Semester students on EDC subject during the semester. All the students from each class participated in this activity. The lab activity is conducted for the students since they don't have the lab in the curriculum. With the help of the lab technicians we have conducted several experiments and explained the students about the practical aspects of the devices and their characteristics.

Objective: Conducting this lab activity for the students in this subject

i) Evaluate students' **grasp of fundamental concepts** such as operation of the devices through their characteristics, etc.
ii) Identify **conceptual gaps or misconceptions** early in the learning process.
iii) Understand the topics from the practical views.

Photos:

For any Queries contact: bhargavakumar.l@bvrithyderabad.edu.in

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Visit to Library – Papers / Articles

Faculty Name: Dr J Naga Vishnu Vardhan

Class / Semester: IV – I / ECE –B

Academic Year: 2024-25

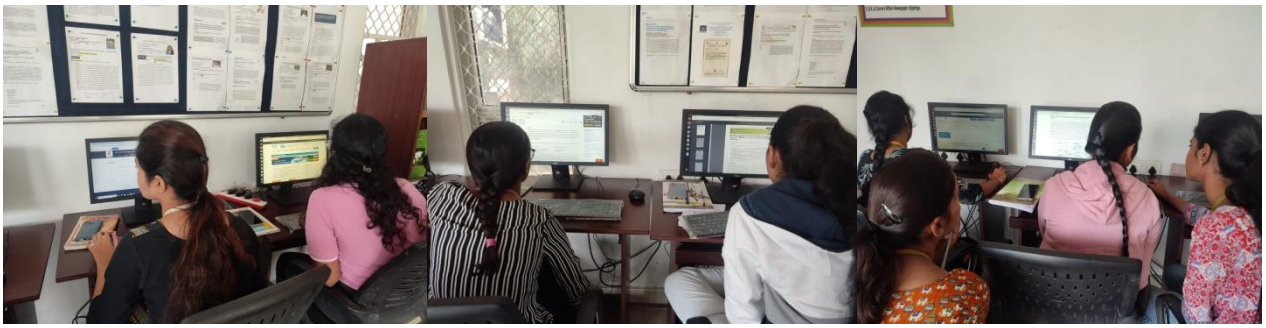
Subject Name: Microwave and Optical Communications

Brief Write - Up

As Students are now aware of the concepts of Microwave and Optical Communications, they were asked to search for papers /articles published in Journals related to the course.

Objective: It helps them to understand about the course and its applications in real world. Some of the articles also inspired them like them Women in Microwaves

Photos:



Some Articles / Papers Mentioned

1. Women in Microwaves
2. *Python for Microwave and RF Engineers*
3. Optical Microwave Generation and Transmission Experiments In The 12- And 60-Ghz Region for Wireless Communications
4. Microwave Industry Outlook—Wireless Communications In Healthcare
5. Leo-Based Optical/Microwave Terrestrial Communications
6. The Benefit of Split Nonlinearity Compensation for Single-Channel Optical Fiber Communications
7. Restoring quantum communication efficiency over high loss optical fibres
8. Analysis of Optical Communications, Fiber Optics, Sensors and Laser Applications
9. Survey on Free Space Optical Communication: A Communication Theory Perspective
10. Recent Advances and Future Perspectives in Optical Wireless Communication, Free Space Optical Communication and Sensing for 6G

For any queries, please contact: vishnu.j@bvrithyderabad.edu.in

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Interesting facts about Microwaves

Faculty Name: Dr J Naga Vishnu Vardhan

Class / Semester: IV – I / ECE –B

Academic Year: 2024-25

Subject Name: Microwave and Optical Communications

Brief Write - Up

Students were asked to share one interesting fact about usage of Microwaves

Objective: Students will get interest on the course and at the same time they will know the importance of the course and its applications.

Photo(s):

Interesting Facts:

The first microwaves were cooled by water but they were later changed to be cooled by air.
Invention by Accident:
The microwave oven was invented accidentally by Percy Spencer, an engineer working for Raytheon. In 1945, while testing a magnetron (a device used in radar systems), he noticed that a chocolate bar in his pocket had melted. This serendipitous discovery led to the development of the first microwave oven, called the 'Radarange,' in 1947.

How Microwaves Can Detect Life Signals through Walls
Microwaves have the fascinating ability to penetrate certain materials (like walls) and detect minute movements caused by life signals, such as breathing and heartbeats. Here's how it works: Principle - Doppler Effect: When microwaves are emitted and reflected back by a moving object (like a chest rising and falling during breathing), there's a slight frequency shift in the returned wave due to motion. This is the Doppler Effect in action.

Interesting fact: Microwaves help astronomers study the Cosmic Microwave Background Radiation (CMB), which provides insights into the universe's origins after the Big Bang.

Interesting facts about microwave engineering - "Advanced Packaging Technology"

Microwaves preserve nutrients. Microwaving is a quick and simple way to heat food, and it preserves more nutrients than conventional cooking methods.

An interesting and unique fact about microwaves in engineering is their use in microwave propulsion systems for spacecraft, such as the experimental EM Drive (Electromagnetic Drive).

For any queries, please contact: vishnu.j@bvrithyderabad.edu.in

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Demonstration of Optical Fiber Working Mechanism and Splicing

Faculty Name: Dr J Naga Vishnu Vardhan

Class / Semester: IV – I / ECE –B

Academic Year: 2024-25

Subject Name: Microwave and Optical Communications

Brief Write - Up

Demonstration was given to students on Optical fiber working and Splicing Mechanism. Explained about measurement of optical power using Multimeter and verification of Optical link using OTTR

Objective: Students gained knowledge on how splicing will be done. Also understand the power loss due to improper splicing, indentifying the cable damage using OTTR etc

Photo(s):

Optical Fiber Demonstration by Mr. Sai Varma, Gateway Info Comm

Demonstrating Coupling Mechanism

Measuring Power using Optical Multimeter

Verification of Output at fiber end after coupling

For any queries, please contact: vishnu.j@bvrithyderabad.edu.in

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Think – Pair – Share

Faculty Name: Mr.R.Priyakanth

Class: II – II / ECE –A

Academic Year: 2024-25

Subject Name: Electromagnetic Fields and Transmission Lines

Topic: Reflection and Refraction phenomenon of EM waves at oblique incidence at Perpendicular polarization

Date: 07-4-2025

Brief Write - Up

This activity is designed to help students explore and understand the behavior of perpendicularly polarized electromagnetic waves when they are incident at an oblique angle on the boundary between two media.

For this Think-Pair-Share activity, the questions posed are

1. What is the change in the vector diagram of perpendicular polarization compared to parallel polarization?
2. What is the difference between parallel and perpendicular polarization in the oblique incidence case?
3. What is the reason for no Brewster's angle for perpendicular polarization?
4. What are the expressions for Reflection and Transmission Coefficients?

Individual Reflection for 10 min

- Each student wrote brief answers and gave the possible sketches.

Peer discussion for 20 min

- Each pair compared their answers.
- Clarified differences in understanding.
- Collaboratively answered the questions posed.

Class-Wide Interaction 20 min

Each pair shared insights with the class. As an Instructor I facilitated:

- Compared multiple pairs' responses to highlight correct reasoning.
- Highlighted how the electric field being perpendicular to the incidence plane causes differences from parallel polarization.
- Explained based on the interaction how the reflection coefficient never becomes zero or Brewster's angle doesn't exist in this case.

Learning Outcome:

Students clearly understood the behaviour of perpendicularly polarized waves at oblique incidence, including:

- The absence of Brewster's angle,
- The form and significance of reflection/transmission coefficients,
- How energy is distributed at the interface.

The response to this activity, completed by the students, is to be submitted through vishnulearning.com for evaluation.

Photo(s):

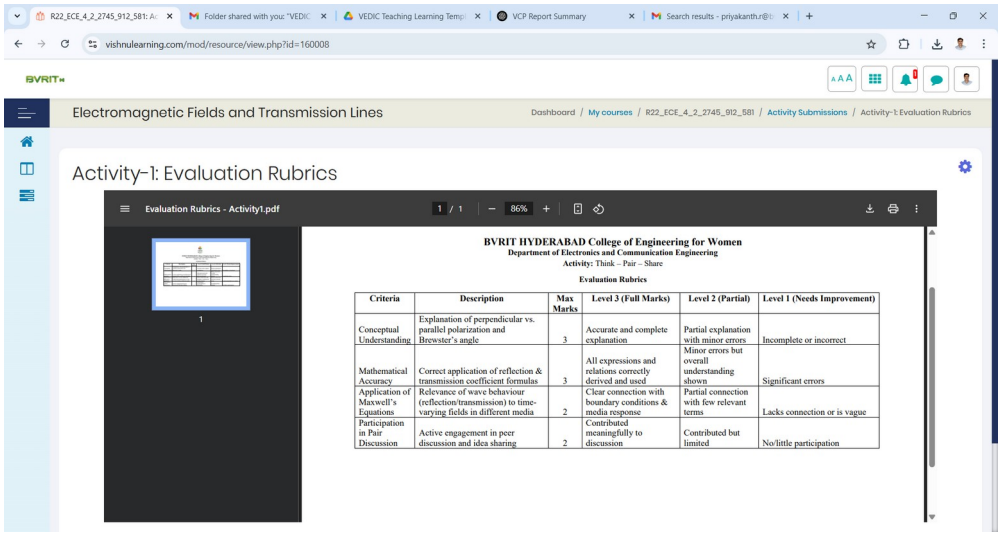

Peer Discussion after individual reflection

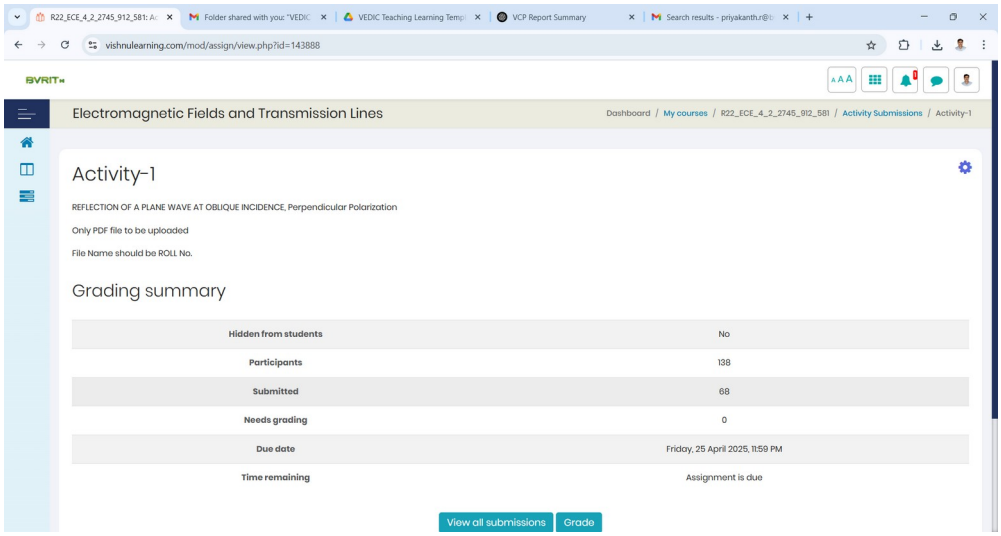

Class wide interaction after peer discussion

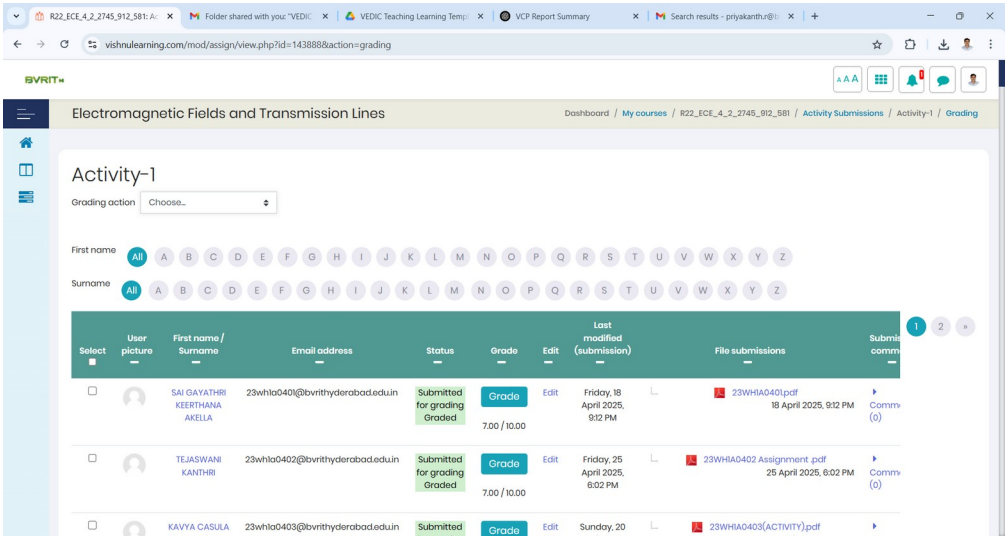
Impact: The activity helped students understand perpendicular polarization better through critical thinking, peer discussion, and application of reflection and transmission concepts.

CO-PO Attainment

Students' written submissions on Vishnulearning.com and evaluation through rubric scores serve as evidence for the attainment of POs 1 (Engineering Knowledge), PO2 (Problem Analysis), PO3 (Design/Development of Solutions)







Roll No.	Conceptual Understanding (3M)	Mathematical Accuracy (3M)	Application of Maxwell's Equations (2M)	Participation in Pair Discussion	Total (10M)

				(2M)	
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BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Flip classroom

Faculty Name: Mr.R.Priyakanth

Class: II – II / ECE –A

Academic Year: 2024-25

Subject Name: Electromagnetic Fields and Transmission Lines

Topic: Solving the Single Stub Tuning using Smith Chart Tool.

Date: 19-4-2025

Brief Write - Up

A flipped classroom activity was conducted to help students understand and solve Single Stub Matching problems using the Smith Chart. Prior to the classroom session, students were provided with a detailed instructional video in vishnulearning.com LMS portal explaining the concept and step-by-step procedure for using the Smith Chart to perform impedance matching with a single stub.

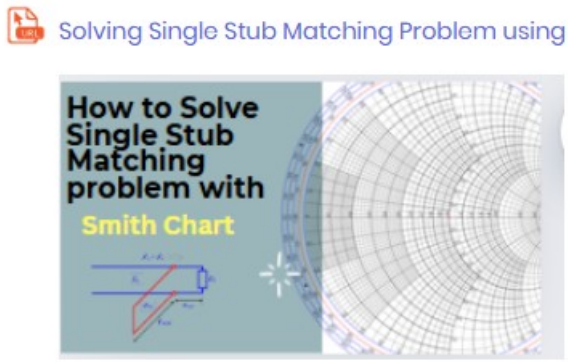
As an instructor, I assigned a Single Stub Tuning problem to students as part of a flipped classroom activity, where they were required to solve the problem using the printed Smith Chart and clarified the doubts raised by students.

During the classroom session, students applied the concepts learned to determine the appropriate location and length of the stub for impedance matching.

Learning Outcome:

Students will be able to apply the Smith Chart to solve impedance matching problems using single stub tuning, demonstrating an understanding of transmission line parameters and configurations.

Photo(s):



Instructional video provided in vishnulearning.com prior to activity
https://www.youtube.com/watch?v=SqcZZjlqHZM

Students solving the Single Stub Matching problem after watching the video prior to classroom session

Course Instructor facilitating the students

Impact:

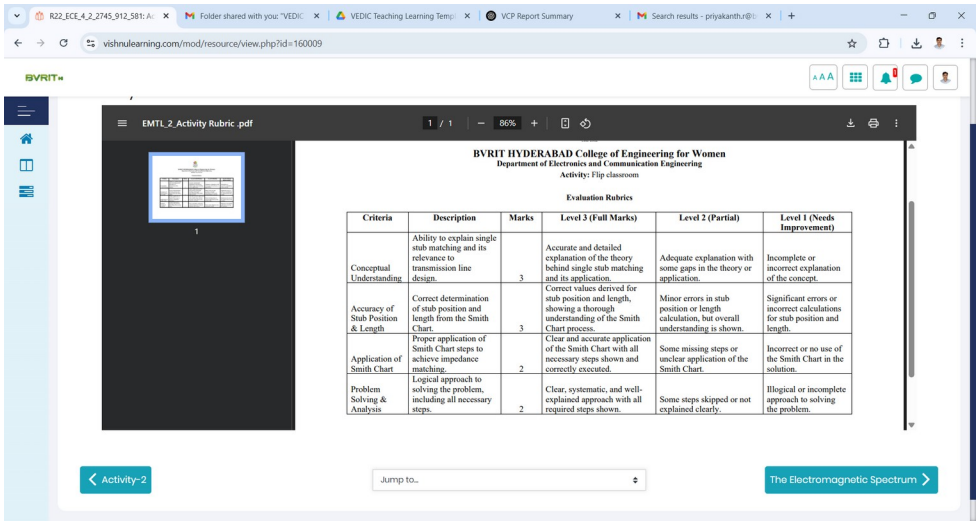
This topic helps students understand how to use the Smith Chart to solve impedance matching problems, improving their skills in transmission line design.

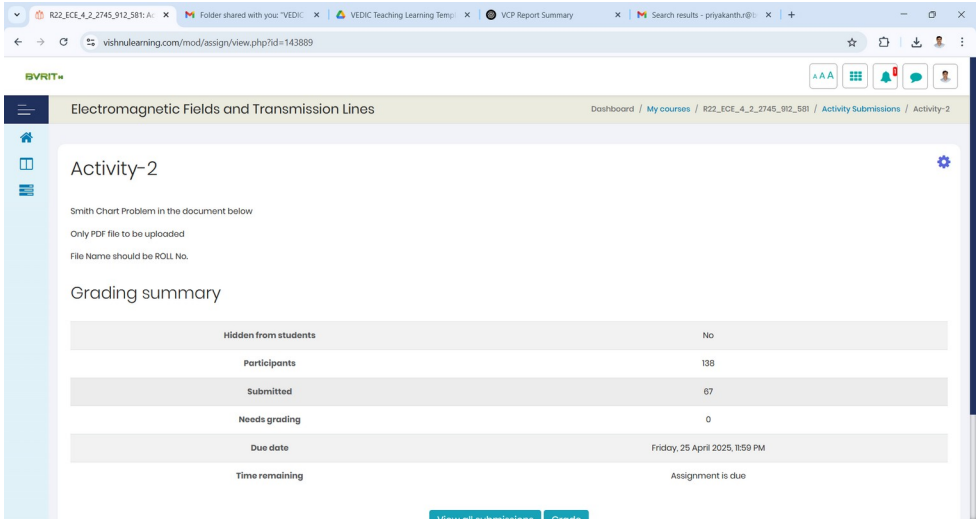
CO-PO attainment:

Individual Submissions are collected through vishnulearning.com, where each student submits their individual solution to the problem.

The student submissions are evaluated based on the rubric, which assesses their understanding and application of the Smith Chart and transmission line matching concepts.

The rubric scores and student feedback will serve as evidence of attainment of Course Outcome (CO) and Program Outcomes (POs) such as PO1 (Engineering Knowledge), PO2 (Problem Analysis), PO5 (Tool Usage).


vishnulearning.com/mod/resource/view.php?id=160009
EMTL_2_Activity Rubric .pdf
BVRIT HYDERABAD College of Engineering for Women
Department of Electronics and Communication Engineering
Activity: Flip classroom
Evaluation Rubrics
Criteria | Description | Marks | Level 3 (Full Marks) | Level 2 (Partial) | Level 1 (Needs Improvement)
Conceptual Understanding | Ability to explain single stub matching and its relevance to transmission line design. | 3 | Accurate and detailed explanation of the theory behind single stub matching and its application. | Adequate explanation with some gaps in the theory or application. | Incomplete or incorrect explanation of the concept.
Accuracy of Stub Position & Length | Correct determination of stub position and length from the Smith Chart. | 3 | Correct values derived for stub position and length, showing a thorough understanding of the Smith Chart process. | Minor errors in stub position or length calculation, but overall understanding is shown. | Significant errors or incorrect calculations for stub position and length.
Application of Smith Chart | Proper application of Smith Chart steps to achieve impedance matching. | 2 | Clear and accurate application of the Smith Chart with all necessary steps shown and correctly executed. | Some missing steps or unclear application of the Smith Chart. | Incorrect or no use of the Smith Chart in the solution.
Problem Solving & Analysis | Logical approach to solving the problem, including all necessary steps. | 2 | Clear, systematic, and well-explained approach with all required steps shown. | Some steps skipped or not explained clearly. | Illogical or incomplete approach to solving the problem.
Activity-2
Jump to...
The Electromagnetic Spectrum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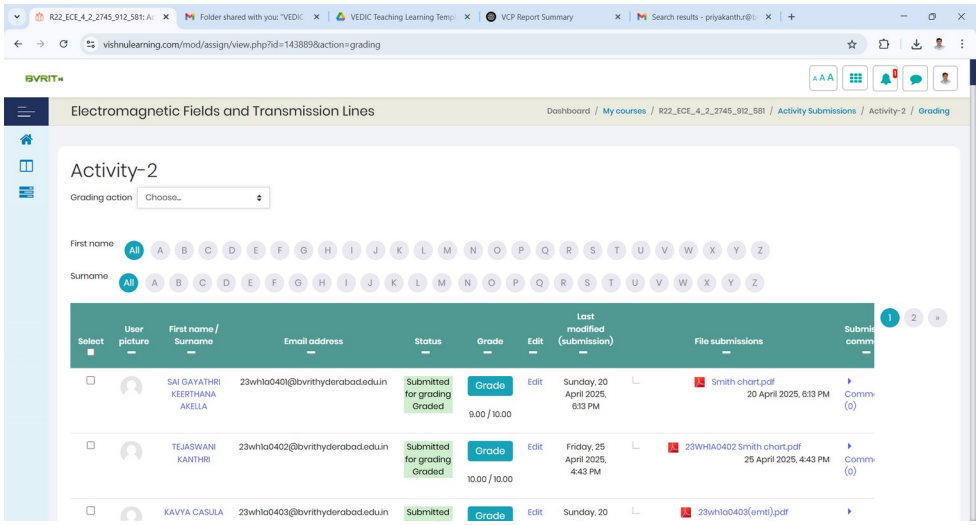
Electromagnetic Fields and Transmission Lines
Dashboard / My courses / R22_ECE_4_2_2745_912_581 / Activity Submissions / Activity-2
Activity-2
Smith Chart Problem in the document below
Only PDF file to be uploaded
File Name should be ROLL No.
Grading summary
Hidden from students | No
Participants | 138
Submitted | 67
Needs grading | 0
Due date | Friday, 25 April 2025, 11:59 PM
Time remaining | Assignment is due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Electromagnetic Fields and Transmission Lines
Dashboard / My courses / R22_ECE_4_2_2745_912_581 / Activity Submissions / Activity-2 / Grading
Activity-2
Grading action Choose...
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Select | User picture | First name / Surname | Email address | Status | Grade | Edit | Last modified (submission) | File submissions | Submi comm
SAI GAYATHRI KEERTHANA AKELLA | 23wh1a0401@bvrithyderabad.edu.in | Submitted for grading Graded | Grade 9.00 / 10.00 | Edit | Sunday, 20 April 2025, 6:13 PM | Smith chart.pdf 20 April 2025, 6:13 PM | Comm (0)
TEJASWANI KANTHRI | 23wh1a0402@bvrithyderabad.edu.in | Submitted for grading Graded | Grade 10.00 / 10.00 | Edit | Friday, 25 April 2025, 4:43 PM | 23WH1A0402 Smith chart.pdf 25 April 2025, 4:43 PM | Comm (0)
KAVYA CASULA | 23wh1a0403@bvrithyderabad.edu.in | Submitted | Grade | Edit | Sunday, 20 | 23wh1a0403(emtl).pdf

Roll No.	Conceptual Understanding (3M)	Accuracy of Stub Position & Length (3M)	Application of Smith Chart (2M)	Problem Solving & Analysis (2M)	Total (10M)
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23WH1A0404	2	2	2	1	7
23WH1A0406	2	2	1	1	6
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23WH1A0463	3	3	2	1	9
23WH1A0464	2	2	1	1	6
24WH5A0401	2	2	2	1	7
24WH5A0402	3	3	2	1	9
24WH5A0403	3	3	2	2	10
24WH5A0404	3	2	2	1	8
24WH5A0405	2	2	1	1	6
24WH5A0406	2	2	2	1	7

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Case Study

Faculty Name: Dr K. Vasu Babu

Class: III – II / ECE –B

Academic Year: 2024-25

Subject Name: Antennas and Wave Propagation

Topic: Half-wave dipole antenna

Case Study Report 1:

Title: Understanding and Application of Half-Wave Dipole Antennas

1. Introduction

Antennas play a critical role in wireless communication systems by transmitting and receiving electromagnetic waves. Among the various types of antennas, the **half-wave dipole antenna** is one of the most fundamental and widely used types due to its simplicity, efficiency, and ease of fabrication. This case study explores the concept, design, and practical applications of half-wave dipole antennas, illustrating their relevance in both theoretical understanding and real-world deployment.

2. Objective of the Case Study

- To understand the working principle of half-wave dipole antennas.
- To analyze the design parameters influencing its performance.
- To investigate its real-time applications in communication systems.
- To develop simulation and experimental skills for validating theoretical concepts.

3. Theoretical Background

A **half-wave dipole antenna** is a linear antenna whose length is approximately half the wavelength ($\lambda/2$) of the frequency at which it operates. It consists of two quarter-wavelength

conductive elements arranged end-to-end with a small gap at the center where the feed line is connected.

Key Properties:

- **Resonant Frequency**: $f=c/\lambda$, where $\lambda \approx 2L$ and c = speed of light.
- **Radiation Pattern**: Omnidirectional in the horizontal plane (doughnut-shaped).
- **Impedance**: Around 73 ohms at resonance, ideal for matching with coaxial cables.

4. Case Scenario: Application in FM Broadcasting

Problem Statement:
A regional FM broadcasting station requires an efficient antenna system for transmitting audio signals over a wide area. The antenna should be simple, cost-effective, and able to operate at 100 MHz.

Solution Using Half-Wave Dipole Antenna:

- **Frequency**: 100 MHz
- **Wavelength (λ)**: $\lambda=3\times10^8 /100\times10^6 = 3$ meters
- **Antenna Length (L)**: $\lambda/2=1.5$ meters
- A half-wave dipole antenna of 1.5 meters total length is designed and mounted at an elevated location to ensure maximum radiation and coverage.

5. Simulation and Analysis

Simulation was carried out using **CST Studio Suite** to validate the radiation characteristics:

- **Return Loss (S_{11})** at 100 MHz: -30 dB (indicating excellent impedance matching).
- **Gain**: 2.15 dBi (ideal for standard dipole).
- **Radiation Pattern**: Typical doughnut shape in the H-plane.

6. Results and Discussion

The half-wave dipole antenna designed for 100 MHz successfully demonstrated the expected theoretical properties in simulation. It achieved a uniform radiation pattern and suitable gain for FM broadcasting. The design also exhibited low cost and ease of construction, validating its suitability for the intended application.

7. Real-Time Applications

- FM/AM Radio Broadcasting
- Television Transmissions (VHF/UHF)
- Wi-Fi and Bluetooth Systems (as reference models)
- Antenna arrays in wireless communication and radar systems
- Educational labs and antenna design training

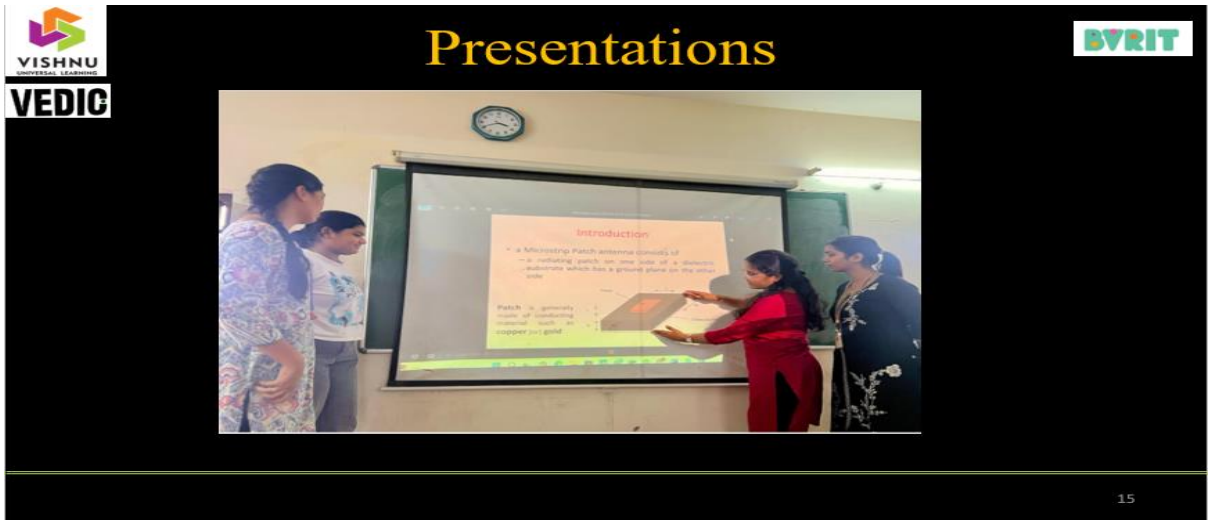
8. Conclusion

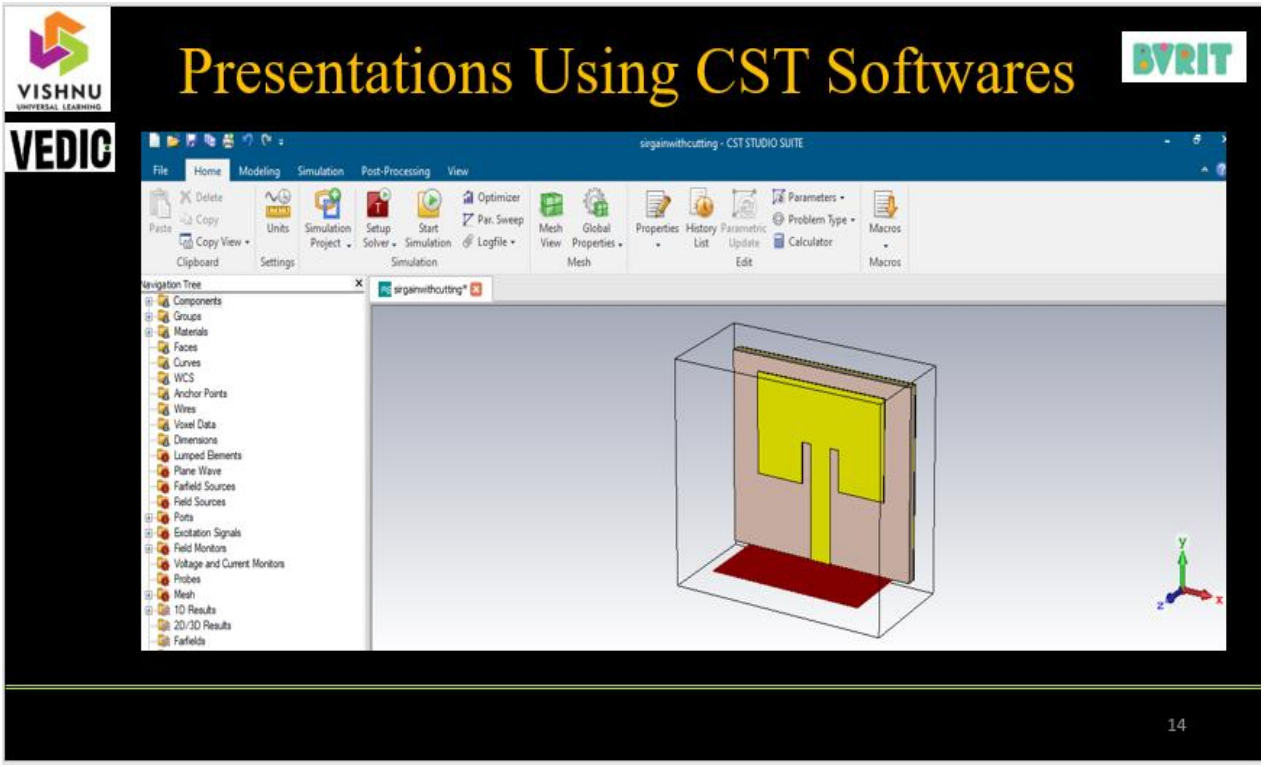
The half-wave dipole antenna is a foundational antenna type that serves as a building block for understanding more complex antenna systems. Its balanced radiation characteristics, simple design, and real-time usability make it an essential component in both theoretical and practical wireless systems. This case study reinforces its value in communication, education, and innovation.

9. References

1. Balanis, C. A. *Antenna Theory: Analysis and Design*, Wiley, 4th Edition.
2. Kraus, J. D. *Antennas*, McGraw-Hill Education.
3. CST Microwave Studio Simulation Tool Documentation.

Case study using Simulation software design process:





Case Study Report 2:

Title: Design and Analysis of PIFA MIMO Antennas for Mobile Phone Applications

1. Introduction

The explosive growth in mobile phone usage, driven by high-speed data and multimedia services, has created a need for compact, high-performance antennas. Planar Inverted-F Antennas (PIFA) have emerged as a leading solution due to their compact structure, low profile, and ability to operate efficiently in confined spaces. When integrated in a Multiple Input Multiple Output (MIMO) configuration, PIFA antennas significantly enhance data throughput, reduce multipath fading, and increase link reliability in modern mobile communication systems.

2. Objectives of the Case Study

- To design a compact PIFA antenna optimized for mobile phone integration.
- To implement a 2×2 or 4×4 MIMO configuration for performance enhancement.
- To evaluate key performance metrics such as isolation, gain, bandwidth, and envelope correlation coefficient (ECC).
- To explore the real-time application of the design in mobile phone environments.

3. Theoretical Background

PIFA Antenna:

A PIFA consists of a radiating patch, a ground plane, a shorting plate or pin, and a feed point. Its resonant frequency depends on its dimensions and the dielectric material used. PIFA is well-suited for mobile phones due to its:

- Compactness
- Ground plane compatibility
- Low SAR (Specific Absorption Rate)
- Multiband tuning capability

MIMO Systems:

Incorporating multiple PIFA antennas into a MIMO system enables spatial multiplexing and diversity, which improves spectral efficiency and communication reliability without increasing bandwidth or power.

4. Case Scenario: PIFA MIMO for 5G Mobile Phones

Problem Statement:

A smartphone manufacturer requires a compact antenna system for 5G sub-6 GHz operation that supports high-speed internet and robust connectivity in urban environments.

Design Solution:

- Frequency bands: 3.3–3.8 GHz (5G NR bands)
- Substrate: FR4, $\varepsilon_r = 4.4$, thickness = 1.6 mm
- Configuration: 4×4 PIFA MIMO antenna system
- Isolation techniques: Defected Ground Structure (DGS) and neutralization lines

5. Simulation and Analysis

Using CST Studio Suite and HFSS, the designed PIFA MIMO antenna system was analyzed:

- **Bandwidth**: ~500 MHz
- **Gain per element**: ~4 dBi

- **Isolation between elements**: >15 dB
- **ECC**: < 0.02 (ensures low correlation for MIMO efficiency)
- **SAR value**: Within IEEE safety limits for mobile use

The PIFA elements were positioned at the top and bottom edges of the PCB to ensure minimal coupling and optimal placement in the phone chassis.

6. Results and Discussion

The results demonstrated that the PIFA MIMO design met the key requirements for integration into 5G mobile devices. The low profile and wide bandwidth ensured effective operation within the designated frequency bands. The high isolation and low ECC confirmed the suitability of the design for MIMO performance. The design also showed robustness to user-hand effects due to the ground plane shielding, making it reliable in practical use.

7. Real-Time Applications

- **5G Smartphones**: For high-speed, multi-stream communication
- **Wearable Devices**: Smartwatches and AR glasses using sub-6 GHz bands
- **IoT Gateways**: Compact hubs needing high-performance wireless links
- **Vehicular Communication**: In smartphones and infotainment systems for connected vehicles

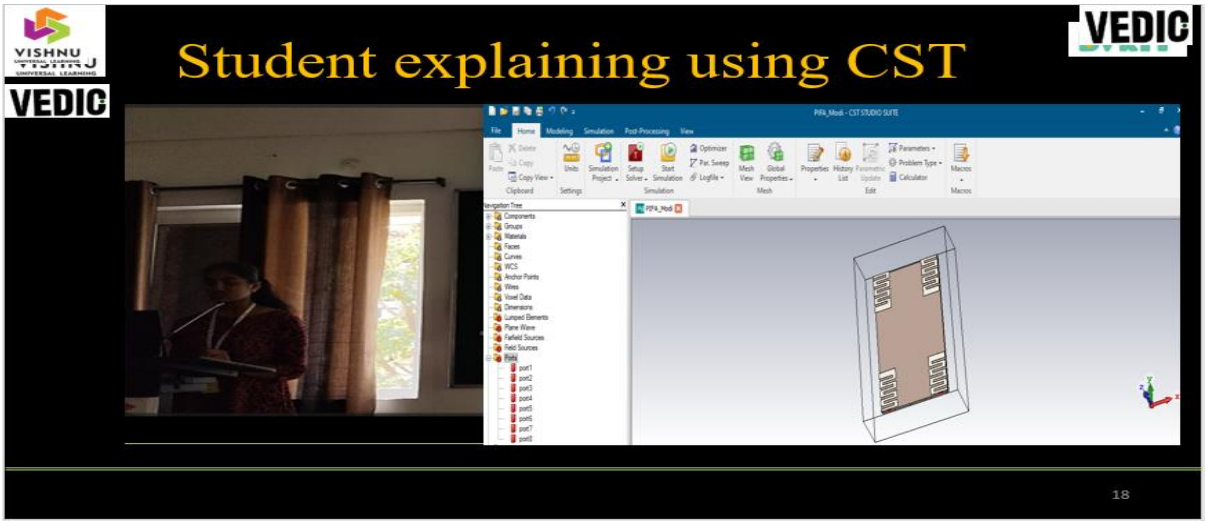
8. Conclusion

The PIFA MIMO antenna design presented in this case study provides an efficient and compact solution for 5G mobile phone applications. It offers the advantages of low profile, multiband support, high isolation, and low ECC, making it ideal for MIMO-enabled devices. Through careful simulation and optimization, this antenna system is well-suited for real-time deployment in modern wireless handsets, contributing to enhanced data rates and user experience.

9. References

1. Balanis, C. A. *Antenna Theory: Analysis and Design*, 4th Edition, Wiley.
2. Liu, L., et al. “Compact PIFA MIMO Antenna with High Isolation for 5G Applications,” *IEEE Access*, 2020.
3. CST Microwave Studio and Ansys HFSS Simulation Tools Documentation.

Real time example designed by students and explaining in the class room:



For calculations of Antenna parameters discussion of students in the class room

BVRIT HYDERABAD College of Engineering for Women

Department of Electronics and Communication Engineering

Activity: Design, Fabrication and Testing of Microstrip Patch Antennas

Faculty Name: Dr K. Vasu Babu

Class: III – II / ECE –B

Academic Year: 2024-25

Subject Name: Antennas and Wave Propagation

Topic: Microstrip Antennas

Project Based Assessments [2M]:

Project Title: Design of Microstrip Antennas

Objectives:

The Project aims to

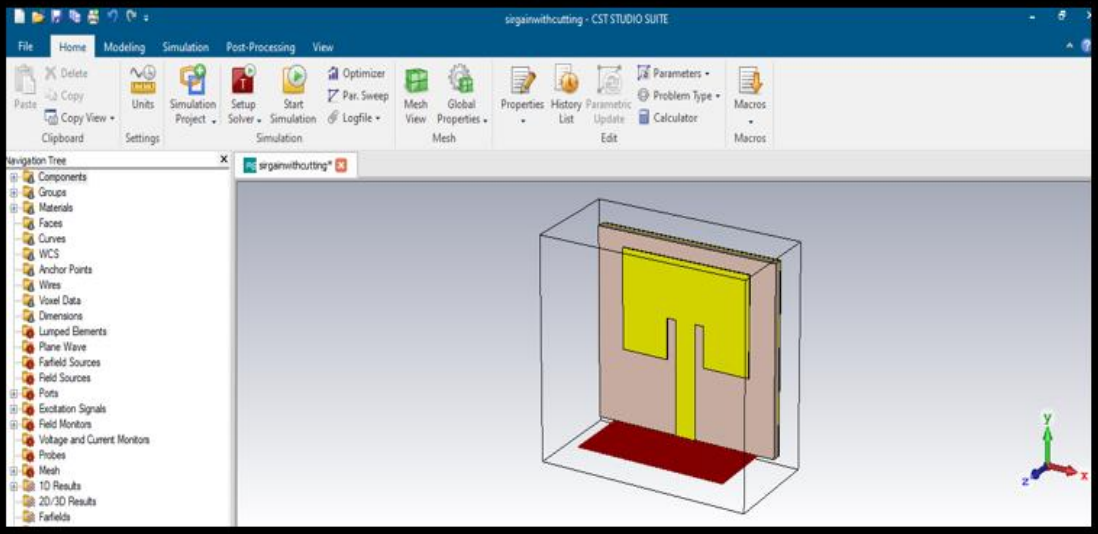
- To achieve a low-profile, lightweight, and compact design suitable for portable and embedded applications.
- To allow mounting on flat or curved surfaces, enabling integration into complex structures like aircraft, satellites, and wearable devices.
- To facilitate simple manufacturing using standard PCB (Printed Circuit Board) techniques and easy integration with active and passive microwave circuits.
- To support multiple frequency bands or wide bandwidths for use in modern communication systems (e.g., Wi-Fi, 5G, GPS, RFID).

Brief Write-Up on Microstrip Antennas

Microstrip antennas, also known as patch antennas, are a type of planar antenna widely used in modern wireless communication systems due to their compact size, lightweight structure, and ease of fabrication. Typically, a microstrip antenna consists of a conducting patch printed on a grounded dielectric substrate. The patch can take various shapes such as rectangular, circular, triangular, or more complex geometries to meet specific performance requirements. These antennas operate efficiently in the microwave frequency range and are particularly well-suited for applications where space and weight constraints are critical, such as in mobile

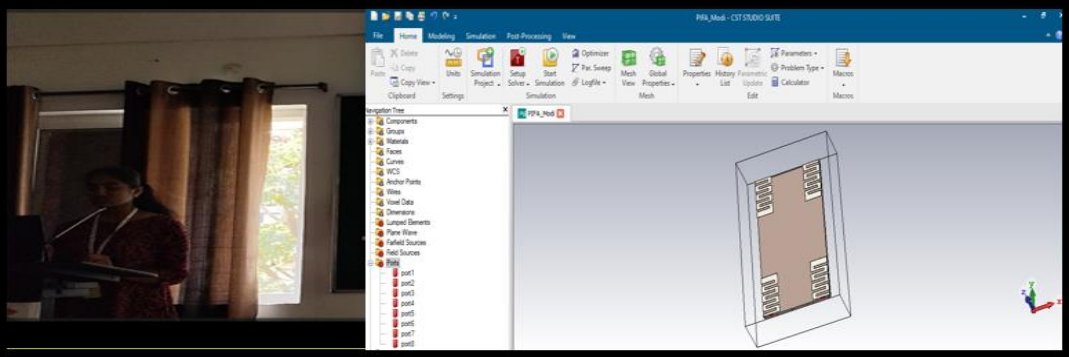
phones, satellites, aircraft, biomedical devices, and Internet of Things (IoT) systems. Their low profile allows them to be conformal to surfaces, making them ideal for embedded or wearable applications. Microstrip antennas support a wide range of features including single and multiband operation, various polarization schemes (linear, circular, dual), and array configurations for beam steering and gain enhancement. Despite challenges such as narrow bandwidth and low power handling, their advantages in cost-effectiveness, mass production, and compatibility with integrated circuit technology make them a popular choice in both commercial and defense sectors. Continuous innovations such as the use of metamaterials, reconfigurable elements, and advanced feeding techniques have further improved their performance, making microstrip antennas a cornerstone of contemporary and next-generation wireless systems like 5G and 6G.

Presentations Using CST Softwares



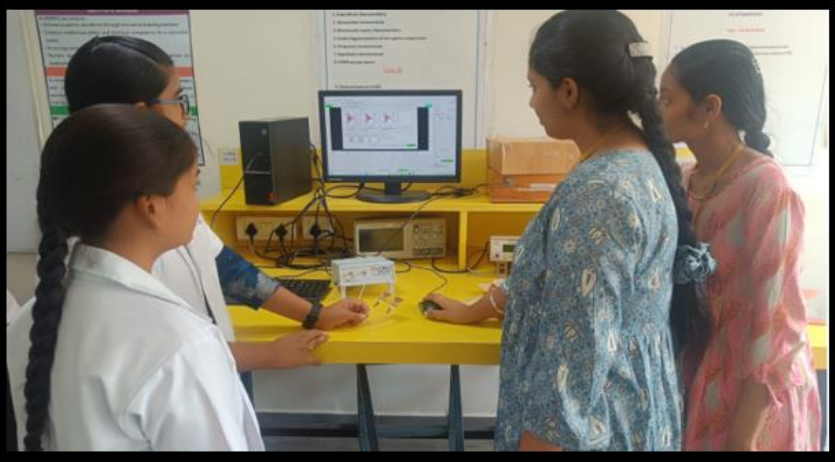
Presentations

Student explaining using CST



Preparing for simulations using Hands on Calculations

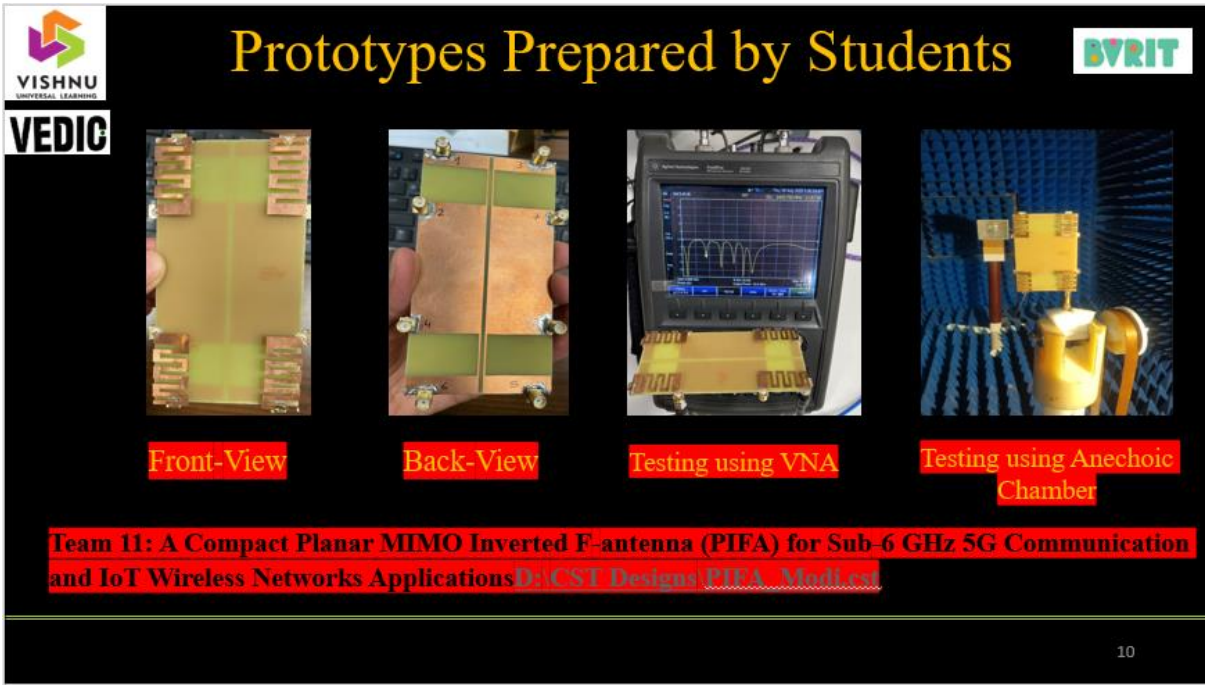
Student explaining using VNA



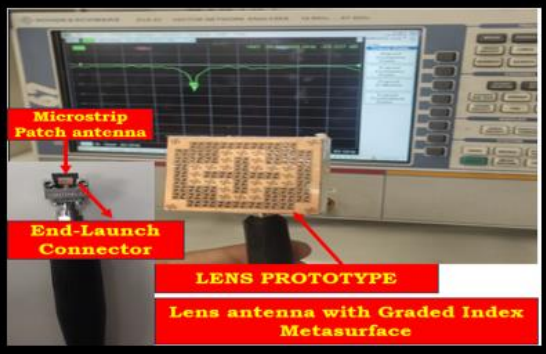
Performance Tasks completed [2M]:-

Various Software & Hardware Tools used: -

Software Tools used	**1. Computer Simulation Technology (CST)** **2. Advanced Design System (ADS)** **3. Origin Pro** **4. MATLAB**
Hardware Tools used	**1. Vector Network Analyzer (VNA)** **2. Anechoic Chamber**



Prototypes Prepared by Students



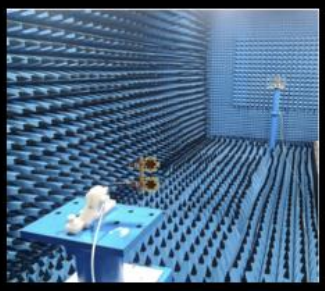
Team 8: Gain Enhancement of mm-Wave Antenna using Graded Index Lens Integrated Frequency Selective Surface for 5G NR FR2 Applications

Prototypes Prepared by Students

Front-View

Back-View

Testing using VNA



Testing using Anechoic Chamber

Team 14: Fractal Slotted Substrate MIMO Antenna with Characteristic Mode Analysis (CMA) for Sub-6GHz n78 5G NR Applications

Rubrics used for Assessments [2M]: -

S. No.	Topics for PPT/Poster Preparation	Team	Activity Type
1	Antenna Parameters	T1	CST Software
2	Equivalent Circuit Analysis patch	T3	ADS
3	Equivalent Circuit Analysis of Helical Antenna	T2	ADS
4	Radiation Patterns Analysis	T4	Origin Pro
5	Dipole Antenna	T6	MATLAB
6	Linear Wire Antennas	T9	MATLAB
7	Rhombic Antenna Design	T10	MATLAB
8	Frequency Selective Surface	T12	Using VNA
9	MIMO Antenna	T7	Using VNA
10	Parabolic Antenna analysis	T14	Using VNA
11	PIFA Antenna	T8	Using VNA
12	Circular patch antenna	T5	CST Software
13	Evaluate the geometrical Dimensions	T11	CST Software
14	*Fractal Antenna*	T13	CST Software
15	THz Antenna Design	T15	CST Software
16	Planar Inverted F-Antenna	T16	CST Software

Impact: After learning about microstrip antennas, students gain a solid understanding of compact and efficient antenna design for modern wireless systems. They develop skills to design antennas tailored for specific applications like 5G, IoT, and aerospace. This knowledge enables innovation in creating cost-effective, high-performance communication systems.

BVRIT HYDERABAD
College of Engineering for Women
(Approved by AICTE, Affiliated to JNTUH)
UGC Autonomous
(Accredited by NBA – EEE, ECE, CSE & IT and NAAC with 'A' Grade)

Event Name: THINK PAIR SHARE

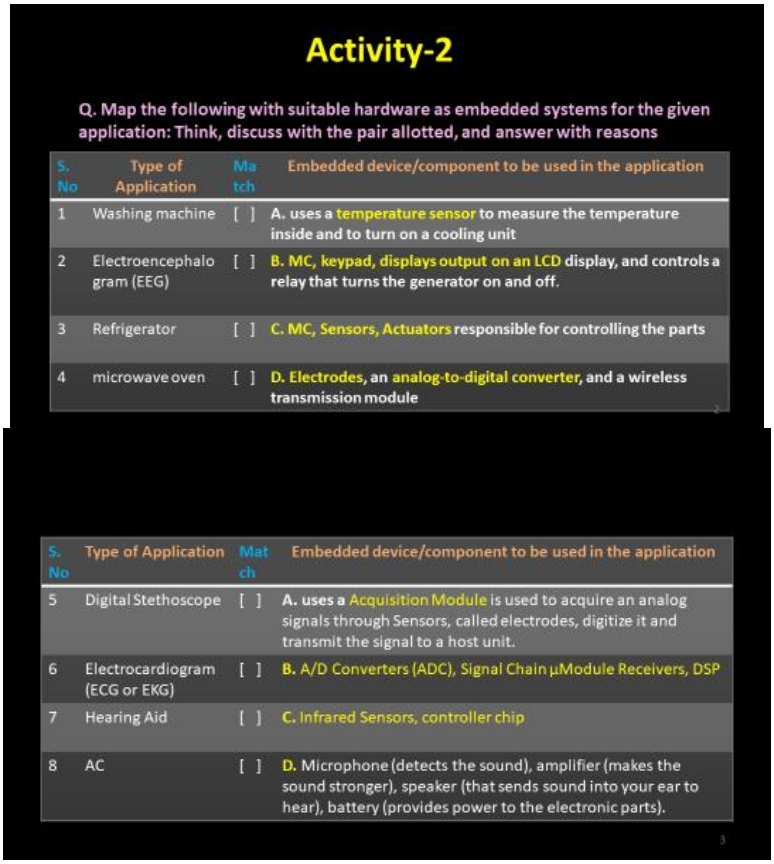
Date (s) of Conduction: 24-07-2024

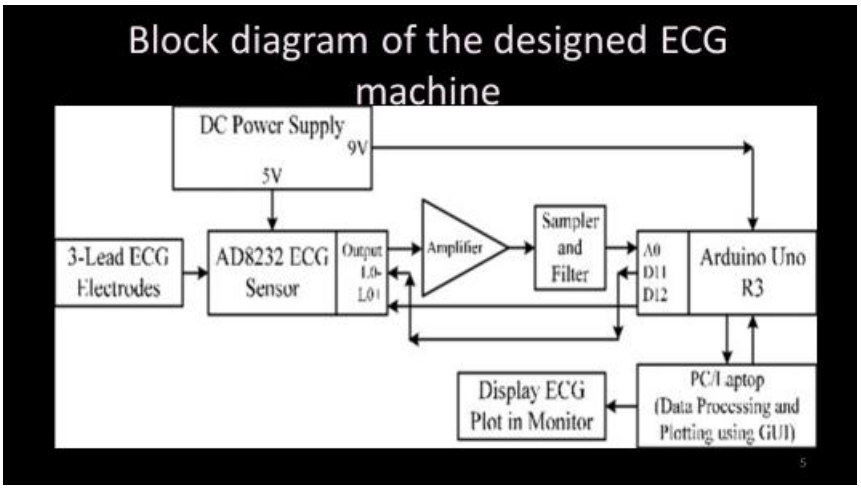
Branch and year: ECE-3A

No. of Participants: 61

Organized by: Dr.M.Parvathi

About the Event: Students are asked to form random groups of 5 members as batch. Each batch is projected with mapping question on given application of embedded system with corresponding block. Finally they were projected with some random of various blocks that were to be identified to make washing machine, refrigerator, traffic light controller, and ECG machine.





The activity is mapped to the following CO

CO No.	Course Outcomes
C326 - Embedded System Design - EC613PE	
C326.2	Recommend suitable hardware for different applications of embedded systems.
C326.6	Differentiate between general purpose operating systems and RTOS.

Evaluation Criteria: Performance evaluation was done based on their score outcomes. Batch 7 stood first with maximum score of 8, Batch-2 & 6 were stood second with the score of maximum 6, followed by batch 4 with score 5.

Batch Numbers	Score Obtained	Position Placed
1	3	
2	6	Second
3	3	
4	5	Third
5	3	
6	6	Second
7	8	First
8	4	