Department of Electrical and Electronics Engineering
Academic Year 2024 – 2025 (Even Semester)
Degree, Semester & Branch: II Semester B.Tech CSBS
Course Code & Title: BE3251 - Basic Electrical and Electronics Engineering
Name of the Faculty member (s): Dr. A.S. Vigneshwar,AP/EEE

Innovative Practice Description

- **Unit / Topic: Unit I / Mesh analysis with Independent sources only (Steady state)**
- **Course Outcome:** CO 1
- **Unit Outcome:** TLO2
- **Activity Chosen:** Think pair share
- **Justification:**
  - ✓ 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.
- **Time Allotted for the Activity:** 10 minutes
- **Details of the Implementation:**
  Think-Pair-Share innovative practice conducted for I year IT students, after explained the concept of Mesh analysis with Independent sources only (Steady state). First, I asked the students to think about how you would apply mesh analysis to analyze the circuit and calculate the mesh currents for 2 minutes. Then I make them as a pair to discuss your approach to solving the circuit using mesh analysis. Share your thoughts, strategies, and the equations you have written for the mesh currents for 3 minutes. Finally, I asked each pair should share their findings with the entire class. One person from each pair will present their approach, the mesh equations, and how they tackled the circuit analysis challenges for 10 minutes.

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	1	-	1	-	1	-

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO9**
	1
Justification for correlation	The students can Function effectively as a team

- **Images / Screenshot of the practice:**

- **Reflective Critique:**
  - ***Feedback of practice from students and other stakeholders:***
    - ✓ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
  - ***Benefit of the practice:***

    Think-pair-sharing forces all students to attempt an initial response to the question, which they can then clarify and expand as they collaborate. It also gives them a chance to validate their ideas in a small group before mentioning them to the large group, which may help shy students feel more confident participating.
  - ***Challenges faced in implementation:***

    I planned the activity for 10 minutes. But in Class room it takes 15 minutes.

References:

1. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020
2. S.K. Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.
3. Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008
4. James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.
5. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.

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Course Code & Title: BE3251 Basic Electrical and Electronics Engineering

Name of the Faculty member: Dr. A.S.Vigneshwar , AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit II / Electrical Machines
- **Course Outcome:** CO 2/ Electrical Machines
- **Topic Learning Outcome:** TLO 4
- **Activity Chosen:** Demonstration
- **Justification:**
    - Explain Electrical Machines
    - After teaching the concept, I thought of conducting this activity for making the students to give the difference between the DC Machines and AC Machines which enhance the learning level and as a teacher I can judge the understanding level of the students.

Time Allotted for the Activity: 5 Minutes

After teaching the concept, give students one or two minutes to think about the topic without writing anything.
Total Strength is 63
Reporter: Myself

At the end the Class (Last 5 minutes)

- I asked the students to think about various types of machines concept for 2 minutes.
- Then I told them to I told them to pair with their neighbours and discuss about the construction parts of DC and AC Machines for another 1 minute.
- Finally, I have shown the DC Motor and AC Motor for each row (3 minutes)

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO12
C111.2	2	1	1

- **PO / PSO mapped:**

Innovative practice	PO1	PO2	PO12
	2	1	1
Justification for correlation	Students will apply the knowledge of Electrical and Electronics engineering fundamental concepts to understand the working of meters.	Students will compare and contrast alternative solution processes to select the best process for the measurement.	Students will describe the rationale for the requirement for continuing professional development

- **Images / Screenshot of the practice:**

❖ *Reflective Critique:*

1. **Pre-implementation Reflection :**
   - **Benefits:**
     - Students are able to attend the question even in the questions are in indirect form.
     - Students are able to explain the concepts in examination without any confusion.
   - **Challenges:**

- In the class few students are hesitate to answer the questions.
- Time utilization for conducting activity.

2. **Post-implementation Reflection :**

- **Benefits:**
  - Students understood the concept which was reflected from their answers for the questions when I have asked during discussion session.
- **Challenges:**
  - Slow learners were not able to understand some topics during discussion hours.

❖ *Benefit of the practice**:*** (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

The assessment of effectiveness of the activity was felt when told most of the points.

- While conducting the activity, I understood that the students are able to explain the construction and working principle of machines.

- The success of the activity was evaluated by asking the same question in **Internal Assessment test I – Around 85%** of students answered.

References:

1. D P Kothari and I.J Nagarath, "Basic Electrical and Electronics Engineering", McGraw Hill Education (India) Private Limited, Second Edition, 2020
2. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.
3. S.K. Bhattacharya, Basic Electrical Engineering, Pearson Education, 2019 4. James A Svoboda, Richard C. Dorf, Dorf's Introduction to Electric Circuits, Wiley,2018

Department of Electrical and Electronics Engineering
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Course Code & Title: BE3251 Basic Electrical and Electronics Engineering

Name of the Faculty member: Dr. A.S.Vigneshwar , AP/EEE

Innovative Practice Description

- **Unit / Topic:** Unit III / Operation of Zener Diode
- **Course Outcome:** CO 3
- **Unit Outcome:** TLO7
- **Activity Chosen:** Virtual Lab
- **Justification:**

Virtual lab refers to a virtual teaching and learning environment aimed at developing students' laboratory skills. As one of the most important eLearning tools, they allow the student to conduct various experiments without any constraints to place or time, in contrast to the constraints of real labs. By this student can understand the characteristics of BJT under CE configuration.

Time Allotted for the Activity: 15 minutes

- **Details of the Implementation:**

The students were asked to do the following steps

1. Set DC voltage to 10 volt.
2. Set the Series Resistance (R_S) to 505 Ω
3. Set Zener voltage (V_Z) to 5.0 V.
4. Vary the Load Resistance (R_L).
5. Voltmeter is placed parallel to load resistor and ammeter series with the series resistor.
6. Choose Load Resistance in such a manner, such that the Zener diode is 'on'.
7. Now note the Voltmeter and Ammeter reading for various Load Resistance.
8. Increase the load resistance (R_L).
9. Note the Load current(I_L), zener current(I_Z), Output voltage(V_O)
10. Calculate the voltage regulation.

CO – PO / PSO mapping:

CO	PO1	PO2	PO8	PO9	PO10	PO12
CO3	2	1	1	1	1	1

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

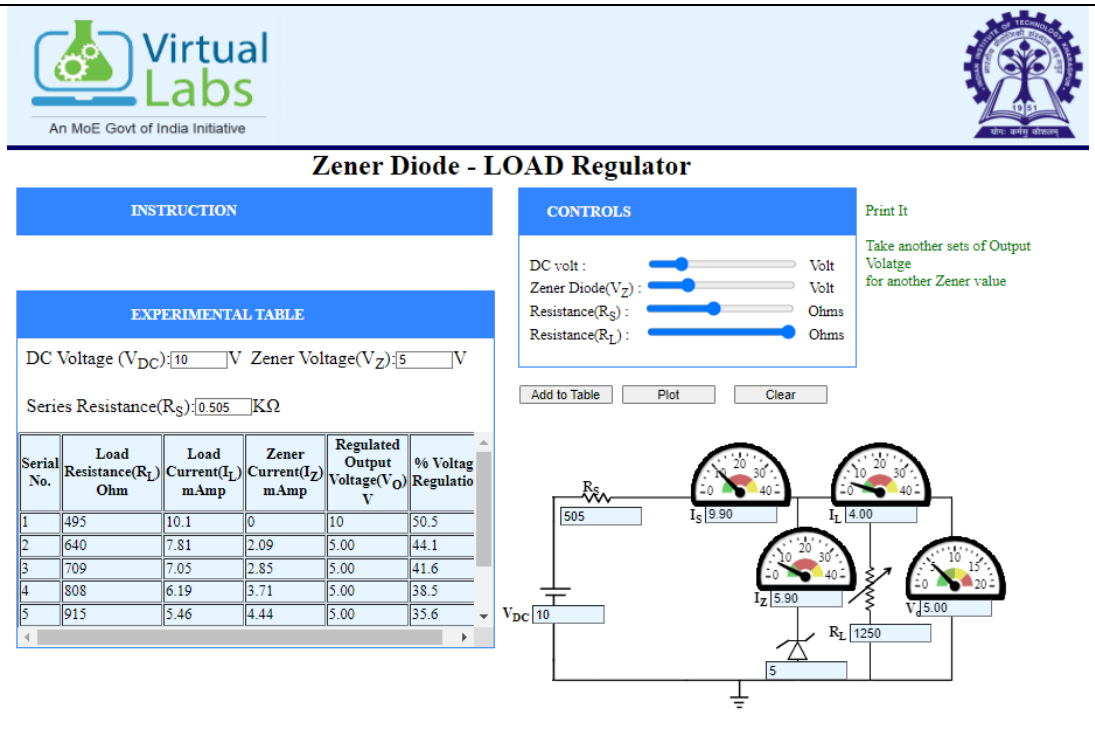
Innovative practice	PO1	PO2	PO8	PO9	PO10	PO12
	2	1	1	1	1	1

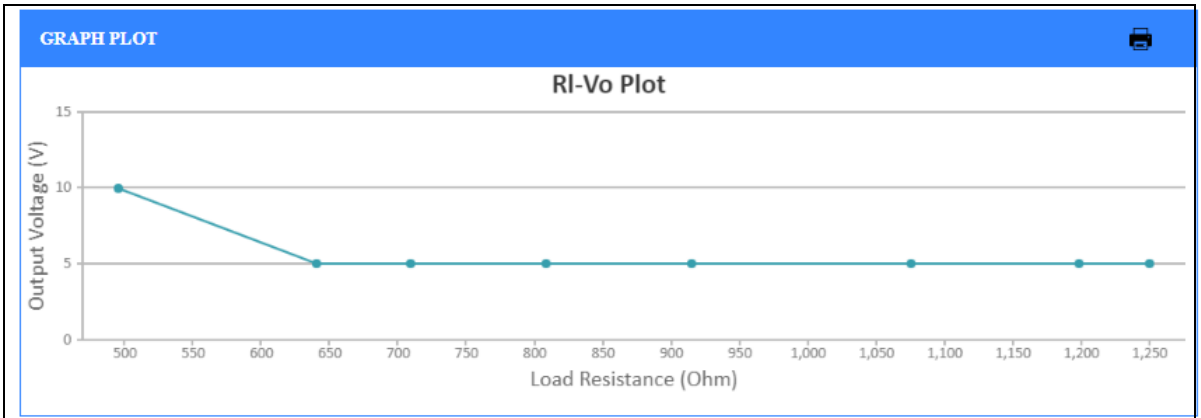
Justification for correlation	Students will apply the knowledge of Electrical and Electronics engineering fundamental concepts to understand the working of meters.	Students will compare and contrast alternative solution processes to select the best process for the measurement.	Students have to follow basic ethical practices to prepare and submit the observations.	Students will function effectively as a team during practical sessions	Students have to ensure the effective communication of engineering activities with the engineering community,	The students can effectively use the virtual lab.

- **Images / Screenshot of the practice:**

Innovative Teaching Method Execution

Operation of Zener Diode – Virtual Lab





- **Reflective Critique:**
  - ❖ ***Feedback of practice from students and other stakeholders:***
    - ✓ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
    - ✓ Also they are able to visualise the IV characteristics of Zener diode, therefore they easily understand the concept.

  - ❖ ***Benefit of the practice:***

    The process of simulating a scenario to practice different responses and actions to a real life situation is extremely effective in knowledge retention. This is because knowledge isn't in theory – the user needs to apply it in a real-life situation. Simulations can be slowed down to study behavior more closely. Conditions can be varied and outcomes investigated. Also Critical situations can be investigated without risk.

  - ❖ ***Challenges faced in implementation:***

    I planned the activity for 15 minutes. But in Class room it takes 25 minutes.

References:

1. David A. Bell , "Electronic devices and circuits", Oxford University higher education, 5th edition 2008.
2. S.K. Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.

Department of Electrical and Electronics Engineering

Academic Year 2025 – 2026 (Even Semester)

Degree, Semester& Branch: II Semester B.Tech CSBS

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Name of the Faculty member: Dr. A.S.Vigneshwar , AP/EEE

Innovative Practice Description

- **Unit / Topic: Unit IV / Procedure for Minimization of Boolean functions using K-map**
- **Course Outcome:** CO 4
- **Unit Outcome:** TLO13
- **Activity Chosen: Strip Sequence**
- **Justification:**
  - ✓ It helps students to arrange a set of objects, such as stages in a biological process or a sequence of historical events, in the correct order.
  - ✓ 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.
- **Time Allotted for the Activity:** 10 minutes
- **Details of the Implementation:**
- Strip Sequence innovative practice conducted for I year IT students, after explained the concept of Procedure for Minimization of Boolean functions using K-map**.** First, I asked the students to think about how you would arrange the list of items written on strips of paper to sort for 2 minutes. Then I make them to recall the steps for Minimization of Boolean functions using K-map and to share your thoughts, strategies, to arrange the strips for 3 minutes. Finally, I asked each pair should share their findings with the entire class. One person from each pair will present their sequence of strips approach and how they tackled to arrange the strips challenges for 10 minutes.

- **CO – PO / PSO mapping:**

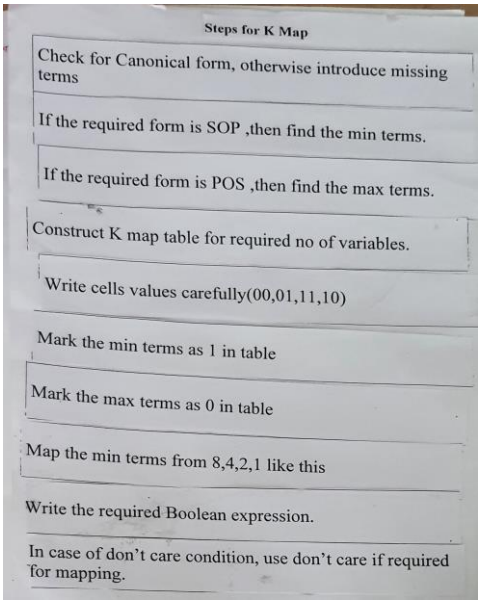
CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	-	-	-	-	1	-	1	-	1	-

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO9**
	1
Justification for correlation	The students can function effectively as a team

- **Images / Screenshot of the practice:**



Steps for K Map

Check for Canonical form, otherwise introduce missing terms

If the required form is SOP ,then find the min terms.

If the required form is POS ,then find the max terms.

Construct K map table for required no of variables.

Write cells values carefully(00,01,11,10)

Mark the min terms as 1 in table

Mark the max terms as 0 in table

Map the min terms from 8,4,2,1 like this

Write the required Boolean expression.

In case of don't care condition, use don't care if required for mapping.

- **Reflective Critique:**
  - ❖ ***Feedback of practice from students and other stakeholders:***
    - ✓ Students understood the concept which was reflected from their answers for the questions I have asked during discussion session.
  - ❖ ***Benefit of the practice:***

    Strip Sequence activity forces all students to attempt an initial response to the question, which they can then clarify and expand as they collaborate. It also gives them a chance to validate their ideas in a small group before mentioning them to the large group, which may help shy students feel more confident in participating.

  - ❖ ***Challenges faced in implementation:***

    The Challenge for students is to work together to reconstruct a proper sequence, due to this, the activity takes 15 minutes. But it is planned for 10 minutes.

References:

1. Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020
2. S.K. Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.
3. Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008
4. James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.
5. A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.

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Innovative Practice Description

- **Unit / Topic:** Unit V / Measurement and Instrumentation
- **Course Outcome:** CO5
- **Topic Learning Outcome:** TLO14.
- **Activity Chosen:** Ungraded Quiz
- **Justification:**

I explained the working and constructions of instruments. I also explained the different types of instruments based on several factors. After teaching this topic ,I thought of this activity for making to have clarity about the instruments. So I can judge the level of understanding.

- **Time Allotted for the Activity:** 10 Minutes
- **Details of the Implementation:**
  - After teaching the concept, I gave students one or two minutes to think about the topic without writing anything.
  - Total Strength :63
  - Reporter: Myself
  - At the end of the Class (Last 10 minutes)
  - I asked the students to think about the types, construction and working of instruments for 2 minutes.
  - Then I told them to write to attend the quiz which is ungraded (8 minutes)
  - Finally, I collected the responses from each student through canvas LMS.

- **CO – PO / PSO mapping:**

CO	PO1	PO2	PO8	PO12
CO3	2	1	1	1

(1 – Low 2 – Moderate 3 – High)

- **PO / PSO mapped:**

Innovative practice	**PO1**	**PO2**	**PO8**	**PO12**
	2	1	1	1
Justification for correlation	Students will apply the knowledge of Electrical and Electronics engineering fundamental concepts to understand the working of meters.	Students will compare and contrast alternative solution processes to select the best process for the measurement.	Students have to follow basic ethical practices to attend this kind of quizzes.	The students can effectively use the canvas LMS.

- **Images / Screenshot of the practice:**

- **Reflective Critique:**
  - ❖ ***Feedback of practice from students and other stakeholders:***

  I preferred this activity because it will help me to evaluate what types of questions I am asking students and what level they are working at.

  Benefit of the practice: (E.g.: Outcome attainment would have increased due to innovative practice over conventional practice)

  The students can understand their knowledge in that particular topic.

❖ ***Challenges faced in implementation:***

- Since it is conducted online, it is very tough to make all students to attend.
- It is difficult to assess whether student have attended the quiz properly or not.

References:

❖ Kothari DP and I.J Nagrath, "Basic Electrical and Electronics Engineering", Second Edition, McGraw Hill Education, 2020

❖ S.K. Bhattacharya "Basic Electrical and Electronics Engineering", Pearson Education, Second Edition, 2017.

❖ Sedha R.S., "A textbook book of Applied Electronics", S. Chand & Co., 2008

❖ James A .Svoboda, Richard C. Dorf, "Dorf's Introduction to Electric Circuits", Wiley, 2018.

❖ A.K. Sawhney, Puneet Sawhney 'A Course in Electrical & Electronic Measurements & Instrumentation', Dhanpat Rai and Co, 2015.