



RAMCO INSTITUTE OF TECHNOLOGY

Approved by AICTE, New Delhi & Affiliated to Anna University
NAAC Accredited with 'A+' Grade & An ISO 9001: 2015 Certified Institution
NBA Accredited UG Programs: CSE, EEE, ECE and MECH

Department of Electronics and Communication Engineering Academic Year 2024 – 2025 (ODD Semester)

Degree, Semester & Branch: B.E., III Semester & ECE 'A'
Course Code & Title: EC3354 & Signals and Systems
Name of the Faculty member (s): Dr.A.Lakshmi

Innovative Practice Description

- **Unit / Topic: Unit 2 – Laplace Transform - Properties**
- **Course Outcome: CO2**
- **Topic Learning Outcome: TLO7**
- **Activity Chosen: Flipped Class**
- **Justification:**

As signals and systems' subject is concerned, the properties of Fourier series, CTFT, DTFT, Laplace transform and Z- transform help to analyses the signal easily. There is only minor variation. If students understand the relation between all the transform and its relation, it's very easy for them to implement where to use which transform. So the Laplace transform properties is taken as collaborative learning under the activity Flipped class. The pupils have the opportunity to explore the subject to learn how the operations are changed. This flipped class exercise was chosen as a result to get them thinking about various properties of LT and its effective implementation in while solving the complex problem.

- **Time Allotted for the Activity: 45 minutes**
- **Details of the Implementation:**

Before the flipped class activity started, students received an outline. Students are given a self-made video to share via Canvas (LMS) as part of the Flipped Class activity. The video clip provided a thorough explanation of textbook difficulties and how to verify theoretical solutions. Since the students have already been split up into groups, they divide their assignments among themselves when they arrive at class. Questions and online resources related to their subject were provided to the students. The preparation of the presentation is allotted ten minutes. The audience will listen as each group presents the

subject they have selected. There will be a chance for attendees to voice any queries or worries they may have after the presentation. This allowed for every group to share in class the concepts they had learned about their individual subjects.

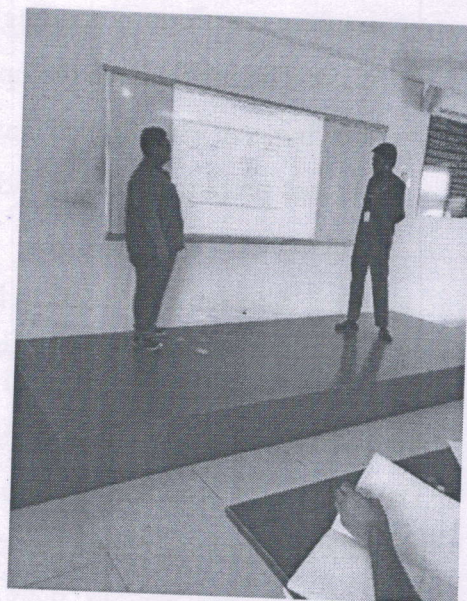
CO – PO / PSO mapping:

CO	PO5	PO9	PSO3
CO2	1	2	2

• **PO / PSO mapped:**

Innovative practice	PO5	PO9	PSO
	1	2	3 2
Justification for correlation	The student will be able to predict the output of the given problem using the properties of Laplace transform and hence it is mapped to 1	The students will be able to explain the analyzing difficult signal using Laplace Transform properties with effective presentations as individual or leader in diverse team hence it is mapped to level 2.	The students will be able to analyze the Signal which is used to complex problem by utilizing their properties; hence it is mapped to level 2.

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



- **Reflective Critique:**

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

The students' ability to apply theory to practical circumstances and their exposure to a variety of viewpoints during group discussions helped them strengthen their presentation skills. They were impressed by the project's potential and the innovative thinking that went into it. Students might receive ideas for the presentation from educational materials, which would help them put it together.

- ❖ **Benefit of the practice:**

Students finished this task successfully. They laid down the assignment for their selected topic in an easy-to-understand way and conceptually prepared the presentation. Every member of the group had a thorough understanding of the subjects. Because they were able to exchange ideas, students who worked in groups were better able to understand the material. Every group member was adept in elucidating the ideas behind different properties and how to apply them to analyze the topic at hand, among other things.

- Challenges faced in implementation:**

- Some pupils had trouble delivering because there wasn't enough communication.
- A few students took longer than was allowed.
- Some students found it challenging to respond to the inquiries raised by other team members.

References:

1. John Alan Stuller, "An Introduction to Signals and Systems", Thomson, 2007
2. 4. P.Ramesh Babu and R.Anandanatarajan, "Signals and Systems", SciTech publications, Fourth Edition.
3. 5. A.Nagoor Kani, "Signals and Systems", Tata McGraw Hill Education Private Limited, Second Edition, 2010.

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Innovative Practice Description

- **Unit / Topic:** Unit 3 – Differential Equation- Laplace transforms in Analysis of CT systems
- **Course Outcome:** CO3
- **Topic Learning Outcome:** TLO11
- **Activity Chosen:** Round Table activity

- **Justification:**

As signals and systems subject is concerned, differential equation using Laplace Transform help to analyses the signal easily. If students understand the relation between the output of the differential equation for various input signal and initial, it's very easy for them to implement where to use which transform. So the Differential equation analysis using Laplace transform is taken as collaborative learning under the activity Round Table. The pupils have the opportunity to explore the subject to learn how the operations are changed. A round table activity is a cooperative learning strategy that involves students working in small groups to share ideas and perspectives on a topic

- **Time Allotted for the Activity:** 45 minutes

- **Details of the Implementation:**

Students form a small group of 4-5 students. Before starting the activity the teacher explains the guidelines of the activity. These guidelines should include the task description, the roles and responsibilities of each group member, the time limit, the materials and resources needed, the expected output or product, and the criteria for evaluation and feedback. Each group will sit in a circle facing each other and then select a moderator to ensure everyone participates and keeps the discussion flowing, keeping the conversation on task and focused on the discussion topic. The moderator will be given a form to keep track of

participation. Each group of students are provided with different questions. Each student takes turns to contribute an idea or a solution to a problem; a round table discussion, where each student shares their opinion or perspective on a topic or a question; or a round table presentation, where each student presents their work or findings to the rest of the group. The teacher will check for understanding, provide guidance and support, intervene when necessary, and encourage participation and engagement. Round table activities can help students develop a sense of ownership over a topic and assume the role of an expert in the area. They can also be used to review material or create applications to a concept.

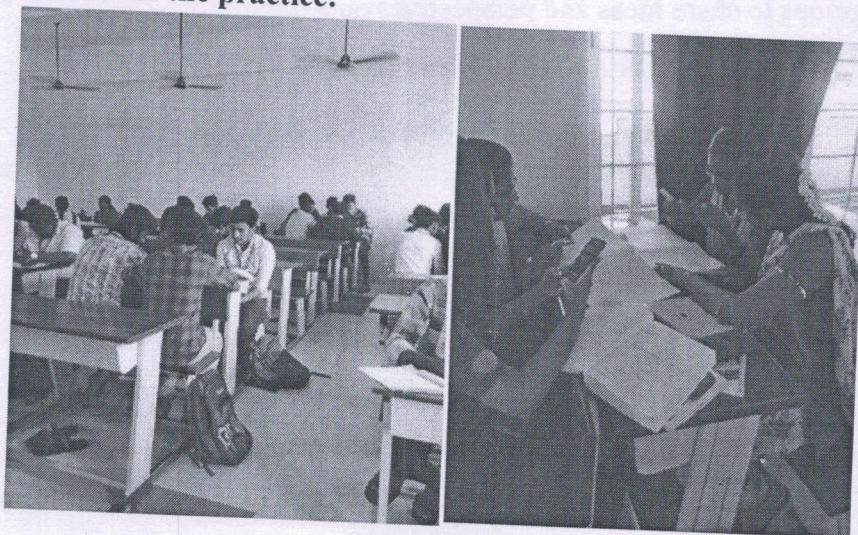
• **CO – PO / PSO mapping:**

CO	PO5	PO9	PSO3
CO2	1	2	2

• **PO / PSO mapped:**

Innovative practice	PO5	PO9	PSO
	1	2	3 2
Justification for correlation	The student will be able to analyse the output of the given differential equation problem using the Laplace transform and hence it is mapped to 1	The students will be able to explain the analyzing differential signal using Laplace Transform with effective discussion as individual or moderator in diverse team hence it is mapped to level 2.	The students will be able to analyze the differential equation with initial conditions and various input signals by utilizing their properties of Laplace transform; hence it is mapped to level 2.

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



- **Reflective Critique:**

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

Roundtable activity can help identify strengths and areas for improvement, and can help create a positive learning culture. Students are given the opportunity to be fully engaged. Each participant is given equal standing in the discussion, enabling them to contribute their ideas freely. It can be a powerful tool for professional development, as it fosters collaboration, communication, critical thinking, and self-awareness.

- ❖ **Benefit of the practice:**

Students finished this task successfully. Round table activities can help students feel more involved and engaged with the material. This activities can help students develop critical thinking skills. Round table activities can help students learn to collaborate with each other. Round table activities can help students avoid boredom with topics that are heavy on facts. Students learn to collaborate with each other and become more self-aware.


Challenges faced in implementation:

- Some pupils had trouble delivering because there wasn't enough communication.
- Shy students or those who don't like interacting with peers may feel uncomfortable.
- A few students took longer than was allowed.
- The moderator faced challenges like managing diverse viewpoints, ensuring equitable participation, keeping the discussion focused.
- Some students found it challenging to respond to the inquiries raised by other team members.

References:

1. John Alan Stuller, "An Introduction to Signals and Systems", Thomson, 2007
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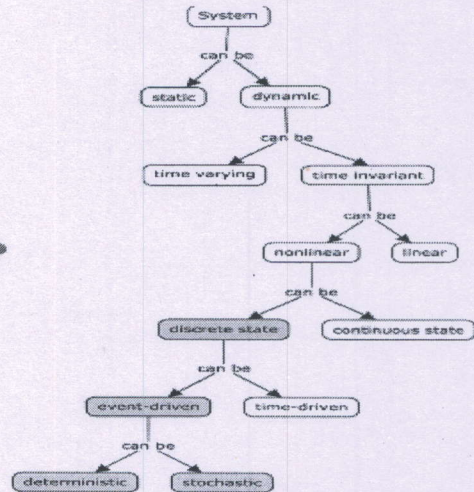
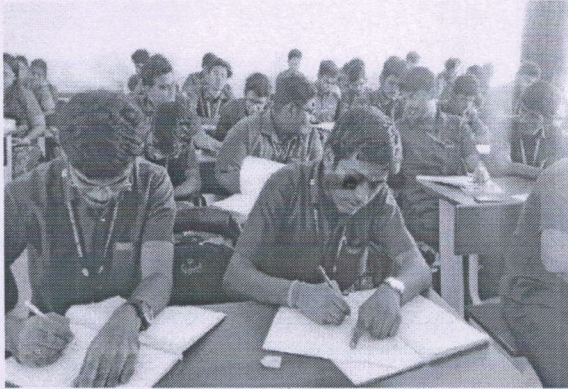
Degree, Semester & Branch: B.E, III& ECE A

Course Code & Title: EC3354 & Signals and Systems

Name of the Faculty member (s): Dr.A.Lakshmi

Active Learning Description

- Unit / Topic: Unit-1 /: Classification of Systems
- Course Outcome: CO1
- Topic Learning Outcome: TLO 4
- Activity Chosen: Mind map



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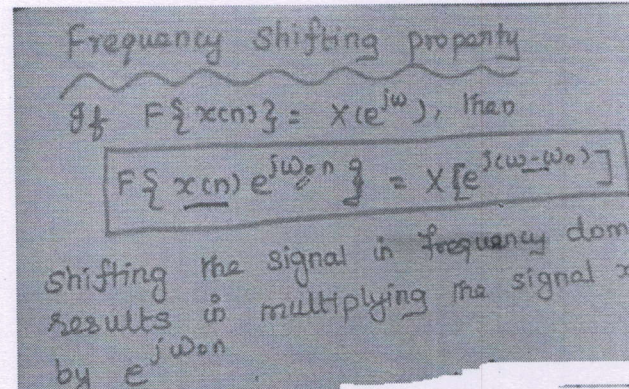
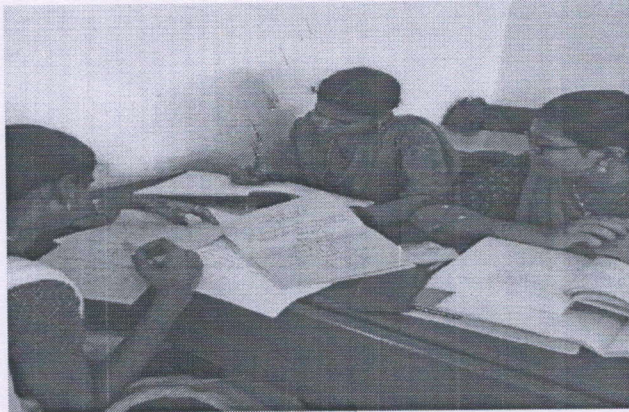
Degree, Semester & Branch: B.E, III & ECE A

Course Code & Title: EC3354 & Signals and Systems

Name of the Faculty member (s): Dr.A.Lakshmi

Active Learning Description

- Unit / Topic: Unit-4/ Open book test
- Course Outcome: CO4
- Topic Learning Outcome: TLO16
- Activity Chosen: Properties of DTFT



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Active Learning Description

- Unit / Topic: Unit-3/ Minute Paper
- Course Outcome: CO3
- Topic Learning Outcome: TLO9
- Activity Chosen: Convolution integrals - Properties



Properties of Convolution.

(i) Commutative Property.

$$x_1(t) * x_2(t) = x_2(t) * x_1(t)$$

(ii) Distributive Property.

$$x_1(t) * [x_2(t) + x_3(t)] \\ = x_1(t) * x_2(t) + x_1(t) * x_3(t)$$

(iii) Associative Property.

$$x_1(t) * [x_2(t) * x_3(t)] \\ = [x_1(t) * x_2(t)] * x_3(t)$$

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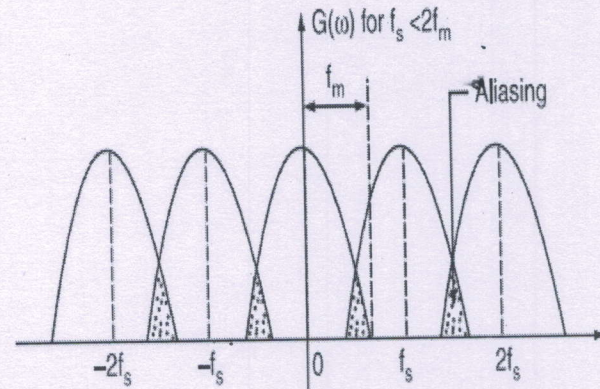
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Name of the Faculty member (s): Dr.A.Lakshmi

Active Learning Description

- Unit / Topic: Unit-4/ Sketch Noting
- Course Outcome: CO6
- Topic Learning Outcome: TLO13, TLO14, TLO15
- Activity Chosen: Baseband signal Sampling, Reconstruction of signal, Aliasing



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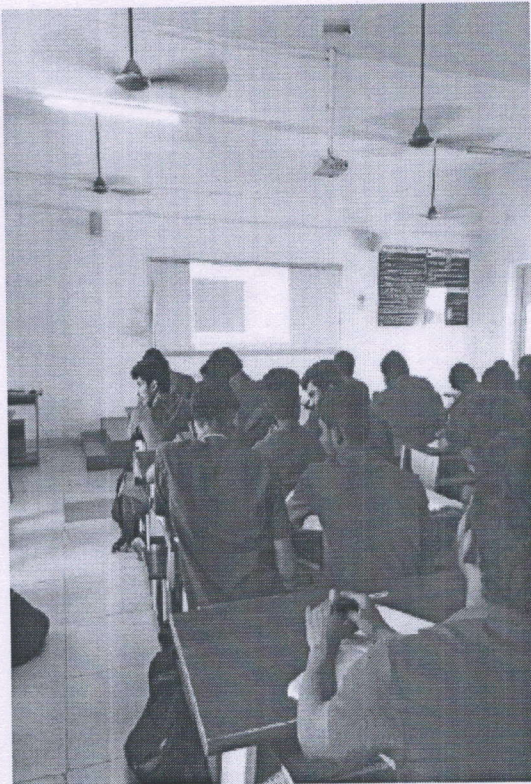
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Name of the Faculty member (s): Dr.A.Lakshmi

Active Learning Description

- Unit / Topic: Unit-5/ Sorting Strips
- Course Outcome: CO5
- Topic Learning Outcome: TLO21, TLO22
- Activity Chosen: Difference Equation- Natural & Forced Response, Total Response



Start	$ax(n) + by(n)$
$aX(Z) + bY(Z)$	$x(n - m)$
$z^{-m}X(Z)$	$a^n \cdot x(n)$
$X(Z/a)$	$x(-n)$
$X(1/Z)$	$x(n) * y(n)$
$X(Z) \cdot Y(Z)$	$x(n) \otimes y(n)$
$X(Z) \cdot Y(Z^{-1})$	Finish

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