Remedial Classes
2021-22

Department of Electrical and Electronics Engineering

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

GRIET

Remedial School

To support the weak students, RS has conducted remedial classes in four phases in the a.y 2021-22.This includes 2 phases of I – year subjects and 2 phases of core subjects. In this document, details of phase2 and phase 3 which are of EEE department are given.

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Remedial Classes
A.Y.2021-22

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GRIET/PRIN/12A/G/21-22 12th Nov 2021

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

REMEDIAL CLASSES 2021-22

CIRCULAR

FINISHING SCHOOL

This is to inform you all that Remedial Classes will be held for academically weak students from November to December 2021.List of students and time tables are send to individual departments.

Dean Finishing School

-

12th Nov 2021

From
Dean,
Finishing school
GRIET.

To
The HOD
EEE
GRIET

Request for faculty and Class rooms to conduct Remedial classes.

Sir/Madam,

This is to inform you that Finishing school of GRIET is conducting Remedial classes for B.Tech II year students to clear their backlogs of Sem-II.

To conduct the classes we request you

1) Permit us to use 2 online classes from 3PM -4PM from 15th November 2021 to 20th November 2021
2) Nominate faculty to teach the following courses:

S.No	YEAR	Course title	No. of Students	Name of the faculty	Signature of the faculty
1	II-II	Control Systems (GR18A2032)	21	Mr. D Karunakumar	Mr. D Karunakumar

Thanking you
Yours Sincerely,
Dr V N Ramadevi

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Finishing School
Remedial Classes Schedule
15th November 2021 to 20th November 2021
II B.Tech II Sem

S.No	Subject	Year	Name of the Faculty	Session-1	Session-2	Session-3	Session-4	Session-5	Session-4
1	Control Systems (GR18A2032)	II-II	Mr. D Karunakumar	15/11/2021 (3.00 to 4.30)	16/11/2021 (3.00 to 4.30)	17/11/2021 (3.00 to 4.30)	18/11/2021 (3.00 to 4.30)	19/11/2021 (3.00 to 4.30)	20/11/2021 (3.00 to 4.30)

HOD-EEE

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DEAN-RS

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

CONTROL SYSTEMS

Course Code: GR18A2032 **L/T/P/C: 3/0/0/3**

II Year II Semester

Course Objectives:

- Outline of the fundamental concepts of Control Systems and block diagram algebra.
- Analyze time response of second order systems, stability and root locus technique.
- Interpret the stability of a system by Nyquist and Bode plots.
- Design the feedback Controller.
- Apply the concepts of Controllability and Observability and define a discrete time system and non linear system.

Course Outcomes:

- Understand the modelling of linear time-invariant systems using transfer function and apply block diagram algebra.
- Understand the concept of time response, stability and its assessment for linear time-invariant systems.
- Compare the Bode and Nyquist plot to determine the stability of a system.
- Determine the dynamic model of a system using state space approach.
- Design of PI,PD controllers and lead ,lag compensators

Unit I: INTRODUCTION TO CONTROL PROBLEM

Industrial Control examples. Mathematical models of physical systems. Control hardware and their models. Transfer function models of linear time-invariant systems.
Feedback Control: Open-Loop and Closed-loop systems. Benefits of Feedback. Block diagram algebra.

Unit II: TIME RESPONSE ANALYSIS

Standard test signals. Time response of first and second order systems for standard test inputs. Application of initial and final value theorem. Design specifications for second-order systems based on the time-response.
Concept of Stability. Routh-Hurwitz Criteria. Relative Stability analysis. Root-Locus technique. Construction of Root-loci.

Unit III: FREQUENCY RESPONSE ANALYSIS

Relationship between time and frequency response, Polar plots, Bode plots. Nyquist stability criterion. Relative stability using Nyquist criterion – gain and phase margin. Closed-loop frequency response.

Unit IV: INTRODUCTION TO CONTROLLER DESIGN

Stability, steady-state accuracy, transient accuracy, disturbance rejection, insensitivity and robustness of control systems.
Root-loci method of feedback controller design. Design specifications in frequency-domain. Frequency-domain methods of design. Application of Proportional, Integral and Derivative Controllers, Lead and Lag compensation in designs. Analog and Digital implementation of controllers.

UnitV: STATE VARIABLE ANALYSIS AND INTRODUCTION TO OPTIMAL CONTROL AND NONLINEAR CONTROL

Concepts of state variables. State space model. Diagonalization of State Matrix. Solution of state equations. Eigenvalues and Stability Analysis. Concept of controllability and observability.

Pole-placement by state feedback.

Discrete-time systems. Difference Equations. State-space models of linear discrete-time systems. Stability of linear discrete-time systems.

Performance Indices. Regulator problem, Tracking Problem. Nonlinear system–Basic concepts and analysis.

Text /Reference Books:

1. K. Ogata, "Modern Control Engineering", Prentice Hall, 1991.
2. B. C. Kuo, "Automatic Control System", Prentice Hall, 1995.
3. M. Gopal, "Control Systems: Principles and Design", McGraw Hill Education, 1997.
4. Control Systems by A. Anand Kumar, 2nd edition, PHI Learning Private Limited.
5. Control Systems Engineering by Nise 3rd Edition John Wiley.
6. I.J. Nagrath and M. Gopal, "Control Systems Engineering", New Age International,2009.

Gokaraju Rangaraju Institute of Engineering and Technology

Electrical and Electronics Engineering

Remedial Classes-A.Y=2020-21- Student Attendance List (P=Present & A=Absent)

Sl.No	Roll.No	Subject Code	Subject Name	15-11-2021	16-11-2021	17-11-2021	18-11-2021	19-11-2021	20-11-2021
1	17241A0231	GR18A2032	Control Systems	P	A	P	P	A	P
2	17241A0299	GR18A2032	Control Systems	A	P	A	A	P	P
3	18241A0202	GR18A2032	Control Systems	A	P	A	A	P	P
4	18241A0205	GR18A2032	Control Systems	P	P	A	P	P	P
5	18241A0205	GR18A2032	Control Systems	P	P	A	P	P	A
6	18241A0209	GR18A2032	Control Systems	P	P	A	P	P	A
7	18241A0220	GR18A2032	Control Systems	P	P	A	P	A	P
8	18241A0223	GR18A2032	Control Systems	P	A	A	A	P	P
9	18241A0244	GR18A2032	Control Systems	A	A	A	P	P	P
10	18241A0248	GR18A2032	Control Systems	P	P	A	P	P	P
11	18241A0254	GR18A2032	Control Systems	P	P	A	P	P	A
12	18241A0257	GR18A2032	Control Systems	P	P	A	P	P	A
13	18241A0260	GR18A2032	Control Systems	P	P	A	P	A	P
14	18241A0260	GR18A2032	Control Systems	P	A	A	A	A	P
15	18241A0262	GR18A2032	Control Systems	A	A	A	P	P	P
16	18241A0280	GR18A2032	Control Systems	A	P	A	P	P	P
17	18241A0288	GR18A2032	Control Systems	A	P	P	P	A	P
18	18241A0288	GR18A2032	Control Systems	A	P	P	A	A	P
19	18241A0288	GR18A2032	Control Systems	P	P	P	P	P	P
20	18241A0290	GR18A2032	Control Systems	P	P	P	P	P	A
21	18241A0290	GR18A2032	Control Systems	P	P	A	P	P	A

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: II
Subject: Control Systems(CS) Faculty Name: Mr. D Karunakumar

S.No	Item	Feedback
1	Material presented	✓Excellent/Very Good/Good/Average/Below Average
2	Teaching Clarity	✓Excellent/Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	Excellent/✓Very Good/Good/Average/Below Average

Suggestions:

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: II
Subject: Control Systems(CS) Faculty Name: Mr. D Karunakumar

S.No	Item	Feedback
1	Material presented	Excellent/✓Very Good/Good/Average/Below Average
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3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	✓Excellent/Very Good/Good/Average/Below Average

Suggestions:

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: II
Subject: Control Systems(CS) Faculty Name: Mr. D Karunakumaer

S.No	Item	Feedback
1	Material presented	Excellent/✓Very Good/Good/Average/Below Average
2	Teaching Clarity	Excellent/✓Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	Excellent/✓Very Good/Good/Average/Below Average

Suggestions:

Dean Finishing School

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Remedial Classes Report
II B.Tech II Sem

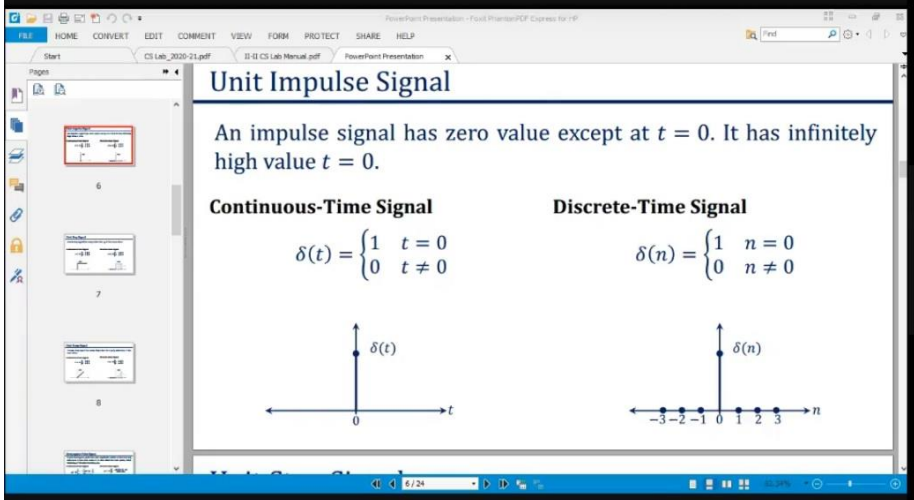
Faculty Report on Subject

Subject: Control Systems

Unit-1: Discussed about Introduction to Control Problem & Feedback Control
Unit-2: Explain about Analysis of Time response of first and second order systems & Concept of Stability
Unit-3: Discussed about Relationship between time and frequency response & Closed-loop frequency response.
Unit-4: Explain about Introduction to Controller Design & Root-loci method of feedback controller design
Unit-5: Discussed about State Variable Analysis and Introduction to Optimal Control And Nonlinear Control

II. Previous question papers
III. Notes or PPTs

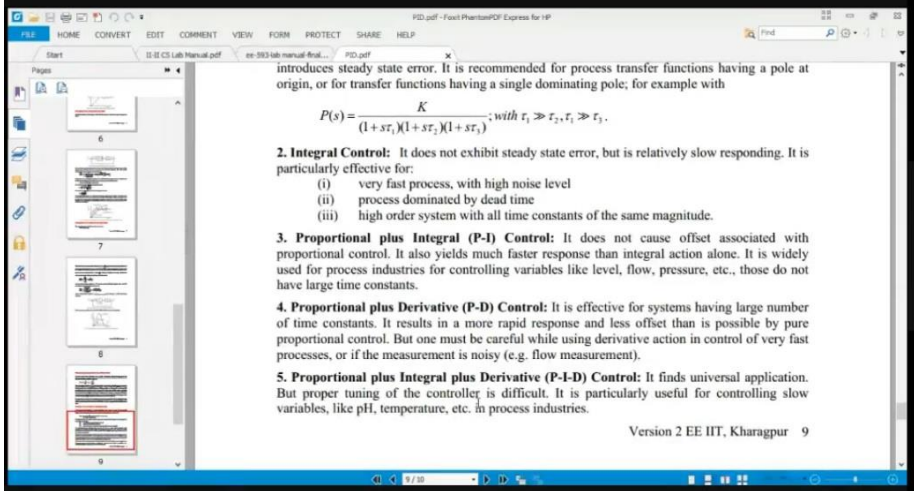
EEE - II , Control Systems



Karuna Kumar D

6:38 / 53:23

EEE - II , Control Systems



introduces steady state error. It is recommended for process transfer functions having a pole at origin, or for transfer functions having a single dominating pole; for example with

$$P(s) = \frac{K}{(1+s\tau_1)(1+s\tau_2)(1+s\tau_3)}; \text{with } \tau_1 \gg \tau_2, \tau_1 \gg \tau_3.$$

2. Integral Control: It does not exhibit steady state error, but is relatively slow responding. It is particularly effective for:

(i) very fast process, with high noise level
(ii) process dominated by dead time
(iii) high order system with all time constants of the same magnitude.

3. Proportional plus Integral (P-I) Control: It does not cause offset associated with proportional control. It also yields much faster response than integral action alone. It is widely used for process industries for controlling variables like level, flow, pressure, etc., those do not have large time constants.

4. Proportional plus Derivative (P-D) Control: It is effective for systems having large number of time constants. It results in a more rapid response and less offset than is possible by pure proportional control. But one must be careful while using derivative action in control of very fast processes, or if the measurement is noisy (e.g. flow measurement).

5. Proportional plus Integral plus Derivative (P-I-D) Control: It finds universal application. But proper tuning of the controller is difficult. It is particularly useful for controlling slow variables, like pH, temperature, etc. in process industries.

Version 2 EE IIT, Kharagpur 9

Karuna Kumar D

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Report on Remedial Classes

This is to inform you that Finishing school of GRIET is conducting Remedial classes for B.Tech II year students to clear their backlogs.

Details are

1. Remedial classes are conducted in different Subjects to support the Students in clearing their backlogs. As the first step, classes are held for Final year and Marched out batches in three different schedules. Students were informed through SMS. Students shown lot of interest .Faculty gave tips as well as material for the students.80-90% of the students who have attended got benefit and they passed in the exams.

2. The classes are aimed to help the students having a maximum of three backlogs so that they will get the degree as per their academic calendar. Students preferred material and few tips as they were busy in Projects. For some subjects they came and attentive.
3. The sessions for II & III-year students are to prevent failure rate and thereby increasing transition rate. The subjects are selected based on I-semester results. To increase attendance for the classes a brief motivation lecture is organized with the key note address by HOD.

   The following shows the courses for which Remedial classes are held and the Transition rate in such course:

S.No	Course	No.of students attended	No.of students passed	Transition rate
1.	Control Systems	17	16	94.12

Gokaraju Rangaraju Institute of Engineering and Technology

Electrical and Electronics Engineering

Remedial Classes

A.Y.2020-21

Sl.No	Roll.No	Subject Code	Subject Name	Result
1	17241A0231	GR18A2032	Control Systems	Pass
2	17241A0299	GR18A2032	Control Systems	Fail
3	18241A0202	GR18A2032	Control Systems	Pass
4	18241A0205	GR18A2032	Control Systems	Pass
5	18241A0209	GR18A2032	Control Systems	Pass
6	18241A0220	GR18A2032	Control Systems	Pass
7	18241A0223	GR18A2032	Control Systems	Pass
8	18241A0244	GR18A2032	Control Systems	Pass
9	18241A0248	GR18A2032	Control Systems	Pass
10	18241A0254	GR18A2032	Control Systems	Pass
11	18241A0257	GR18A2032	Control Systems	Pass
12	18241A0260	GR18A2032	Control Systems	Pass
13	18241A0262	GR18A2032	Control Systems	Pass
14	18241A0280	GR18A2032	Control Systems	Pass
15	18241A0288	GR18A2032	Control Systems	Pass
16	18241A0288	GR18A2032	Control Systems	Pass
17	18241A0290	GR18A2032	Control Systems	Pass

Remedial Classes
2021-22
(Phase -3)

Department of Electrical and Electronics Engineering

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
(Autonomous)

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Remedial Classes
A.Y.2021-22

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GRIET/PRIN/12A/G/21-22 19th Jan 2022

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

REMEDIAL CLASSES 2021-22

CIRCULAR

FINISHING SCHOOL

This is to inform you all that Remedial Classes will be held for academically weak students from January to February 2022. List of students and time tables are send to individual departments.

Dean Finishing School

-

19th Jan 2022

From
Dean,
Finishing school
GRIET.

To
The HOD
EEE
GRIET

Request for faculty and Class rooms to conduct Remedial classes.

Sir/Madam,

This is to inform you that Finishing school of GRIET is conducting Remedial classes for B.Tech II year students to clear their backlogs of Sem-I.

To conduct the classes we request you

1) Permit us to use 2 online classes from 3.30PM -4.30PM from 21st January 2022 to 31st January 2022
2) Nominate faculty to teach the following courses:

S.No	YEAR	Course title	No. of Students	Name of the faculty	Signature of the faculty
1	II-I	Electrical Circuit Analysis (GR20A2023)	29	Mr. D Karunakumar	Mr. D Karunakumar
2	II-I	Electromagnetic Fields (GR20A2026)	31	Mr. P Praveen Kumar	Mr. P Praveen Kumar

Thanking you
Yours Sincerely,
Dr V N Ramadevi

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Finishing School
Remedial Classes Schedule (ONLINE)
21st January 2022 to 31st January 2022
II B.Tech I Sem

S.No	Subject	Year	Name of the Faculty	Session-1	Session-2	Session-3	Session-4
1	Electrical Circuit Analysis (GR20A2023)	II-I	Mr. D Karunakumar	27/01/2022 (3.30 to 4.30)	28/01/2022 (3.30 to 4.30)	29/01/2022 (3.30 to 4.30)	31/01/2022 (3.30 to 4.30)
2	Electromagnetic Fields (GR20A2026)	II-I	Mr. P Praveen Kumar	21/01/2022 (3.30 to 4.30)	22/01/2022 (3.30 to 4.30)	24/01/2022 (3.30 to 4.30)	25/01/2022 (3.30 to 4.30)

HOD-EEE

(Faculty Coordinator)

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ELECTRICAL CIRCUIT ANALYSIS

Course Code: GR20A2023 **L/T/P/C :2/1/0/3**
II Year I Semester

Course Objectives:

1. Explain the various properties of Fourier series and Fourier transforms.
2. Simplify the transient state analysis of a circuit.
3. Evaluate the steady state analysis(three-phase) and dot convention of a given circuit.
4. Apply the Laplace Transforms to electrical circuits.
5. Develop the network parameters of the circuits.

Course Outcomes:

1. Apply Fourier Series, network theorems for the analysis of electrical circuits.
2. Develop the transient response of electrical circuits.
3. Analyze three-phase and mutually coupled circuits.
4. Solve electrical circuits using Laplace and Inverse Laplace transform and mark poles and zeros.
5. Simplify network by two port parameters.

UNIT I
FOURIER SERIES AND FOURIER TRANSFORM

Representation of continuous-time periodic signals by Fourier series; Dirichlet's conditions; Properties of Fourier series, Parseval's theorem; Trigonometric and Exponential Fourier series; Complex Fourier spectrum; Fourier transform via Fourier series; Fourier transform of periodic and aperiodic signals; Convergence of Fourier transform; Properties of Fourier transforms, Parseval's theorem; Fourier transforms involving impulse function and Signum function; Introduction to Hilbert Transform.

UNIT II
NETWORK THEOREMS

Maximum Power Transfer theorem, Reciprocity theorem, Millman theorem, Compensation theorem, Telligence Theorem, Concept of duality and dual networks.

Solution of First and Second order networks

Solution of first and second order differential equations for Series and parallel RL, RC, RLC circuits, initial and final conditions in network elements, forced and free response, time constants, steady state and transient state response.

UNIT III
THREE PHASE CIRCUITS AND COUPLED CIRCUITS

Three-phase circuits, star-star, delta-delta analysis of balanced circuits, unbalanced analysis of three phase 3 wire, 4 wire, delta circuits, measurement of power by three and two watt meters, measurement of reactive power by single wattmeter, Mutual coupled circuits, Dot Convention in coupled circuits.

UNIT IV
ELECTRICAL CIRCUIT ANALYSIS USING LAPLACE TRANSFORMS

Review of Laplace Transform, Analysis of electrical circuits using Laplace Transform for standard inputs, convolution integral, Inverse Laplace Transform, transformed network with initial conditions, Transfer function representation, Poles and Zeros.

UNIT V
TWO PORT NETWORKS

Two Port Networks, terminal pairs, relationship of two port variables, impedance, admittance, hybrid and transmission parameters, condition for symmetry and reciprocity, interrelationship between various parameters, interconnections of two port networks (series, parallel and cascade)

Text Books

1. W. H. Hayt and J. E. Kemmerly, "Engineering Circuit Analysis", McGraw Hill Education, 2013.
2. C. K. Alexander and M. N. O. Sadiku, "Fundamentals of Electric Circuits", McGraw Hill Education, 2004.
3. M. E. Van Valkenburg, "Network Analysis", Prentice Hall, 2006.

References

1. Circuit Theory (Analysis and Synthesis) by A.Chakrabarti-Dhanpat Rai & Co.
2. Network Theory by N.C.Jagan and C.Lakshminarayana, BS Publications.
3. K. V. V. Murthy and M. S. Kamath, "Basic Circuit Analysis", Jaico Publishers, 1999.
4. D. Roy Choudhury, "Networks and Systems", New Age International Publications, 1998.

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY
ELECTROMAGNETIC FIELDS

Course Code: GR20A2026 **L/T/P/C: 3/0/0/3**
II Year I Semester

Course Objectives:

1. Apply vector Calculus and different coordinates systems for Electro and Magnetic systems.
2. Understand the knowledge of Electro field theory for Point, Line, Surface Charge.
3. Understand the concept of conductors, dielectrics, inductance, capacitance.
4. Ability to do Calculations of MFI for Line, Surface Conductors with different Shapes.
5. Ability of mathematical representation and analysis of EM waves at media interfaces.

Course Outcomes:

1. Solve the problems in different EM fields using Different Coordinates Systems.
2. Evaluate the Electric Field Density and Intensity for Different Charges.
3. Understand the Electromagnetic Relation using Maxwell Formulae.
4. Analyze circuits using Conductors in Time Varying Fields.
5. Analyze and solve problems of EM wave propagation at media interfaces.

UNIT I
STATIC ELECTRIC FIELD
Coulomb's law- Electric Field Intensity-Electrical Field due to Point charge, Line, Surface and Volume Charge distributions. Gauss Law and its Applications. Absolute Electric potential- Potential difference-Calculation of potential differences for different configurations. Electric Dipole- Electrostatic Energy density.

UNIT II
CONDUCTORS
Dielectrics and Capacitance Current and current density- Ohms Law in Point form- Continuity of current-Boundary conditions of perfect dielectric materials. Permittivity of dielectric materials- Capacitance-Capacitance of a two-wire line- Poisson's equation- Laplace's equation- Solution of Laplace and Poisson's cquation- Application of Laplacc's and Poisson's cquations.

UNIT III
STATIC MAGNETIC FIELDS- Biot-Savart Law- Ampere Law-Magnetic flux and Magnetic Flux Density- Scalar and Vector Magnetic Potentials. Steady Magnetic Fields produced by current carrying conductors. Magnetic Forces-Materials and Inductance Force on a moving charge-Force on a differential current element- Force between differential current elements- Nature of magnetic materials- Magnetization and Permeability- magnetic boundary conditions- Magnetic Circuits- inductances and mutual inductances.

UNIT IV
TIME VARYING FIELDS and Maxwell's Equations Faraday's law for Electromagnetic induction-Displacement current- Point form of Maxwell's equation- Integral form of Maxwell's equations- Motional Electromotive forces, Boundary Conditions.

UNIT V
WAVE EQUATIONS AND SOLUTIONS, Time-harmonic fields, Plane waves in lossless media, Plane waves in lossy media (low-less dielectrics and good conductors), Group Velocity, Electromagnetic power flow and poynting vector, Normal incidence at a plane conducting boundary, Normal incidence at a plane dielectric boundary.

Text/Reference Books:

1. Matthew N.O.Sadiku, "Principles of Electromagnetics", Oxford University Publication, 2014.
2. W.Hayt, John A.Buck "Engineering Electromagnetics", McGraw Hill Education, 2012.
3. Pramanik, "Electromagnetism-Problems with solution", Prentice Hall India, 2012.
4. G. W. Carter, "The electromagnetic field in its engineering aspects", Longmans, 1954.
5. Pramanik, "Electromagnetism - Theory and applications", PHI Learning Pvt. Ltd, New Delhi, 2009

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Remedial Classes-II B.Tech I Sem-2021-22
Remedial Classes- Student Attendance List (P=Present & A=Absent)

Sl.No	Roll.No	Subject Code	Subject Name	27-01-2022	28-01-2022	29-01-2022	31-01-2022
1	20241A0201	GR20A2023	Electrical Circuit	P	A	P	P
2	20241A0202	GR20A2023	Electrical Circuit	P	A	P	A
3	20241A0203	GR20A2023	Electrical Circuit	P	A	A	A
4	20241A0207	GR20A2023	Electrical Circuit	A	P	A	A
5	20241A0209	GR20A2023	Electrical Circuit	A	P	A	A
6	20241A0210	GR20A2023	Electrical Circuit	P	P	A	P
7	20241A0213	GR20A2023	Electrical Circuit	P	P	A	P
8	20241A0214	GR20A2023	Electrical Circuit	P	P	A	P
9	20241A0219	GR20A2023	Electrical Circuit	P	P	A	P
10	20241A0221	GR20A2023	Electrical Circuit	P	A	A	A
11	20241A0222	GR20A2023	Electrical Circuit	A	A	A	P
12	20241A0225	GR20A2023	Electrical Circuit	P	A	P	P
13	20241A0226	GR20A2023	Electrical Circuit	P	A	P	A
14	20241A0227	GR20A2023	Electrical Circuit	P	A	A	A
15	20241A0228	GR20A2023	Electrical Circuit	A	P	A	A
16	20241A0231	GR20A2023	Electrical Circuit	A	P	A	A
17	20241A0234	GR20A2023	Electrical Circuit	P	P	A	P
18	20241A0236	GR20A2023	Electrical Circuit	P	P	A	P
19	20241A0237	GR20A2023	Electrical Circuit	P	P	A	P
20	20241A0243	GR20A2023	Electrical Circuit	P	P	A	P
21	20241A0244	GR20A2023	Electrical Circuit	P	A	A	A
22	20241A0250	GR20A2023	Electrical Circuit	A	A	A	P
23	20241A0252	GR20A2023	Electrical Circuit	A	P	A	P
24	20241A0255	GR20A2023	Electrical Circuit	A	P	P	P
25	20241A0256	GR20A2023	Electrical Circuit	A	P	P	A
26	20241A0257	GR20A2023	Electrical Circuit	P	P	P	P
27	21245A0207	GR20A2023	Electrical Circuit	P	P	P	P
28	21245A0208	GR20A2023	Electrical Circuit	P	P	A	P
29	21245A0209	GR20A2023	Electrical Circuit	P	P	A	P
Sl.No	**Roll.No**	**Subject Code**	**Subject Name**	**21-01-2022**	**22-01-2022**	**24-01-2022**	**25-01-2022**
1	20241A0201	GR20A2023	Electromagnetic Fields	P	A	P	P
2	20241A0207	GR20A2023	Electromagnetic Fields	P	A	A	P
3	20241A0208	GR20A2023	Electromagnetic Fields	P	A	P	P
4	20241A0209	GR20A2023	Electromagnetic Fields	P	A	P	A
5	20241A0212	GR20A2023	Electromagnetic Fields	P	A	A	A
6	20241A0213	GR20A2023	Electromagnetic Fields	A	P	A	A
7	20241A0214	GR20A2023	Electromagnetic Fields	A	P	A	A
8	20241A0219	GR20A2023	Electromagnetic Fields	P	P	A	P
9	20241A0220	GR20A2023	Electromagnetic Fields	P	P	A	P
10	20241A0221	GR20A2023	Electromagnetic Fields	P	P	A	P
11	20241A0225	GR20A2023	Electromagnetic Fields	P	P	A	P
12	20241A0227	GR20A2023	Electromagnetic Fields	P	A	A	A
13	20241A0228	GR20A2023	Electromagnetic Fields	A	A	A	P
14	20241A0231	GR20A2023	Electromagnetic Fields	A	P	A	P
15	20241A0234	GR20A2023	Electromagnetic Fields	P	A	P	P
16	20241A0236	GR20A2023	Electromagnetic Fields	P	A	P	A
17	20241A0238	GR20A2023	Electromagnetic Fields	P	A	A	A
18	20241A0241	GR20A2023	Electromagnetic Fields	A	P	A	A
19	20241A0242	GR20A2023	Electromagnetic Fields	A	P	A	A
20	20241A0244	GR20A2023	Electromagnetic Fields	P	P	A	P
21	20241A0245	GR20A2023	Electromagnetic Fields	P	P	A	P

22	20241A0250	GR20A2023	Electromagnetic Fields	P	P	A	P
23	20241A0252	GR20A2023	Electromagnetic Fields	P	P	A	P
24	20241A0253	GR20A2023	Electromagnetic Fields	P	A	A	A
25	20241A0255	GR20A2023	Electromagnetic Fields	A	A	A	P
26	20241A0256	GR20A2023	Electromagnetic Fields	A	P	A	P
27	21245A0202	GR20A2023	Electromagnetic Fields	A	P	P	P
28	21245A0203	GR20A2023	Electromagnetic Fields	A	P	P	A
29	21245A0207	GR20A2023	Electromagnetic Fields	P	P	P	P
30	21245A0208	GR20A2023	Electromagnetic Fields	P	P	P	P
31	21245A0209	GR20A2023	Electromagnetic Fields	P	P	A	P

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: I
Subject: Electrical Circuit Analysis (ECA) Faculty Name: Mr. D Karunakumar

S.No	Item	Feedback
1	Material presented	✓Excellent/Very Good/Good/Average/Below Average
2	Teaching Clarity	✓Excellent/Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	Excellent/✓Very Good/Good/Average/Below Average

Suggestions:

V N Ramadevi

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: I
Subject: Electrical Circuit Analysis (ECA) Faculty Name: Mr. D Karunakumar

S.No	Item	Feedback
1	Material presented	Excellent/✓Very Good/Good/Average/Below Average
2	Teaching Clarity	Excellent/✓Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	✓Excellent/Very Good/Good/Average/Below Average

Suggestions:

V N Rama Devi

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: I
Subject: Electrical Circuit Analysis (ECA) Faculty Name: Mr. D Karunakumar

S.No	Item	Feedback
1	Material presented	Excellent/✓Very Good/Good/Average/Below Average
2	Teaching Clarity	Excellent/✓Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	Excellent/✓Very Good/Good/Average/Below Average

Suggestions:

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: I
Subject: Electromagnetic Fields Faculty Name: Mr. P Praveen Kumar

S.No	Item	Feedback
1	Material presented	✓Excellent/Very Good/Good/Average/Below Average
2	Teaching Clarity	✓Excellent/Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	Excellent/✓Very Good/Good/Average/Below Average

Suggestions:

V N Ramadevi

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: II
Subject: Control Systems(CS) Faculty Name: Mr. D Karunakumar

S.No	Item	Feedback
1	Material presented	Excellent/✓Very Good/Good/Average/Below Average
2	Teaching Clarity	Excellent/✓Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	✓Excellent/Very Good/Good/Average/Below Average

Suggestions:

Dean Finishing School

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING & TECHNOLOGY

FINISHING SCHOOL

REMEDIAL CLASSES (Academic support for students) Student Feed Back

Branch: EEE Year: II Sem: II
Subject: Control Systems(CS) Faculty Name: Mr. D Karunakumaer

S.No	Item	Feedback
1	Material presented	Excellent/✓Very Good/Good/Average/Below Average
2	Teaching Clarity	Excellent/✓Very Good/Good/Average/Below Average
3	Covering of important topics	Excellent/✓Very Good/Good/Average/Below Average
4	Doubts clarification	Excellent/✓Very Good/Good/Average/Below Average

Suggestions:

Dean Finishing School

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Remedial Classes Report
II B.Tech I Sem

Faculty Report on Subject

Subject: Electrical Circuit Analysis

Unit-1: Discussed about Fourier Series and Fourier Transform & Properties of Fourier Series & Fourier transforms, Parseval's theorem.

Unit-2: Explain about Network Theorems & Solution of First and Second order networks

Unit-3: Discussed about Three Phase Circuits and Coupled Circuits

Unit-4: Explain About Electrical Circuit Analysis Using Laplace Transforms & Inverse Laplace Transform, Transformed Network with Initial Conditions, Transfer Function Representation, Poles and Zero

Unit-5: Discussed about Two Port Networks & Interrelationship between Various Parameters, Interconnections of Two Port Networks

II. Previous question papers

III. Notes or PPTs

Gokaraju Rangaraju Institute of Engineering and Technology
Electrical and Electronics Engineering
Remedial Classes Report
II B.Tech I Sem

Faculty Report on Subject

Subject: Electromagnetic Fields

Unit-1: Coulomb's law- Electric Field Intensity- Electrical Field due to Point charge

Unit-2: Explain about Dielectrics and Capacitance Current and current density- Ohms Law in Point form

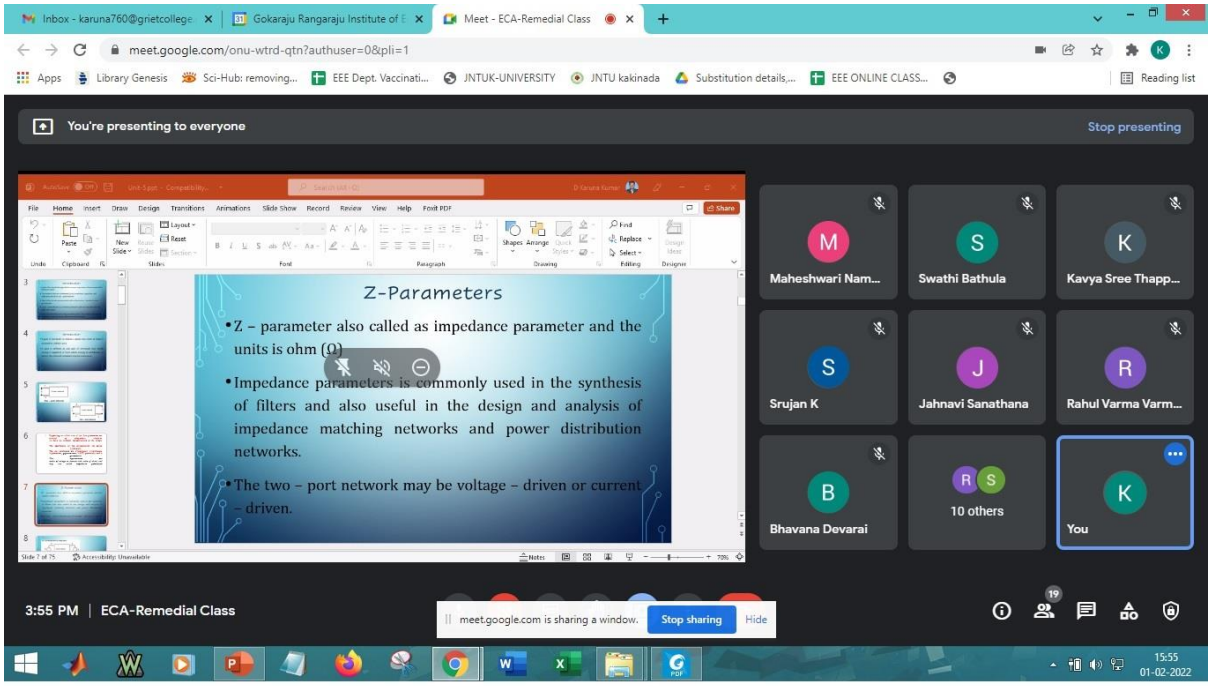
Unit-3: Discussed about Biot-Savart Law- Ampere Law-Magnetic flux and Magnetic Flux Density- Scalar and Vector Magnetic Potentials.

Unit-4: Explain about Time Varying Fields and Maxwell's Equations Faraday's law for Electromagnetic induction Displacement current

Unit-5: Discussed about Wave Equations and Solutions, Time-harmonic fields, Plane waves in lossless media

II. Previous question papers

III. Notes or PPTs


Inbox - karuna760@grietcollege
Gokaraju Rangaraju Institute of E
Meet - ECA-Remedial Class
meet.google.com/onu-wtrd-qtn?authuser=0&pli=1
You're presenting to everyone
Stop presenting
Z-Parameters
•Z – parameter also called as impedance parameter and the units is ohm (Ω).
•Impedance parameters is commonly used in the synthesis of filters and also useful in the design and analysis of impedance matching networks and power distribution networks.
•The two – port network may be voltage – driven or current – driven.
Maheshwari Nam...
Swathi Bathula
Kavya Sree Thapp...
Srujan K
Jahnavi Sanathana
Rahul Varma Varm...
Bhavana Devarai
10 others
You
3:55 PM | ECA-Remedial Class
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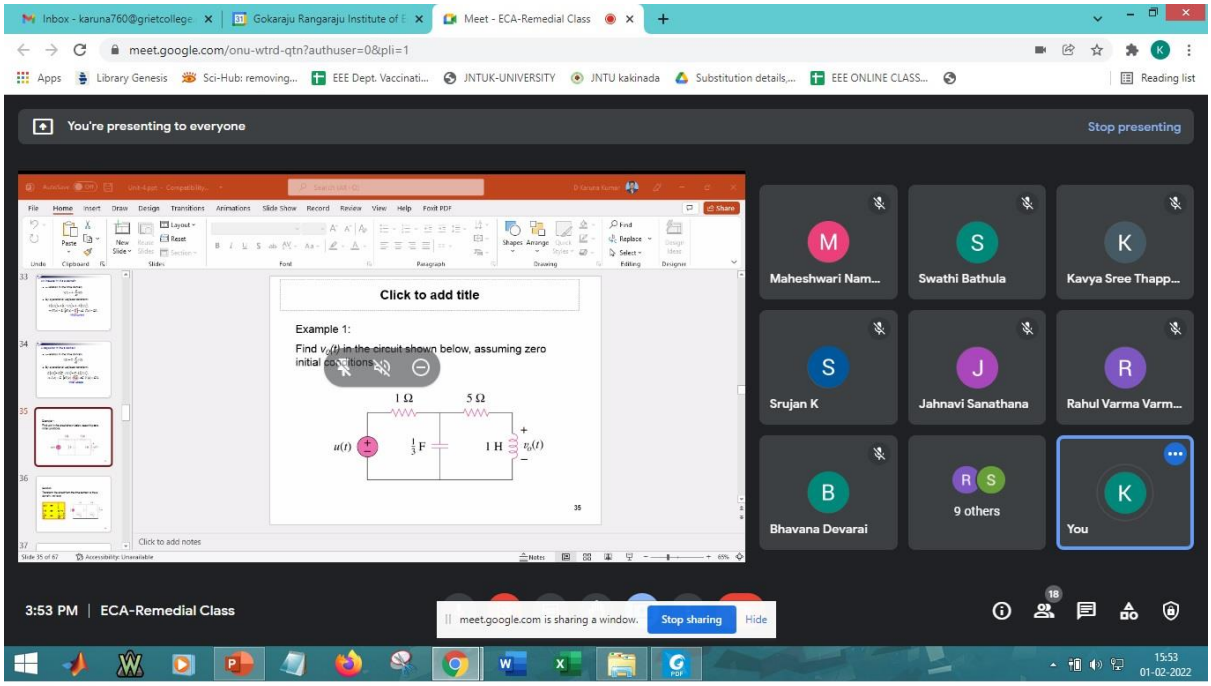
01-02-2022


Inbox - karuna760@grietcollege
Gokaraju Rangaraju Institute of E
Meet - ECA-Remedial Class
meet.google.com/onu-wtrd-qtn?authuser=0&pli=1
You're presenting to everyone
Stop presenting
Click to add title
Example 1:
Find $v_0(t)$ in the circuit shown below, assuming zero initial conditions.
1 Ω
5 Ω
u(t)
1/3 F
1 H
$v_0(t)$
Maheshwari Nam...
Swathi Bathula
Kavya Sree Thapp...
Srujan K
Jahnavi Sanathana
Rahul Varma Varm...
Bhavana Devarai
9 others
You
3:53 PM | ECA-Remedial Class
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15:53
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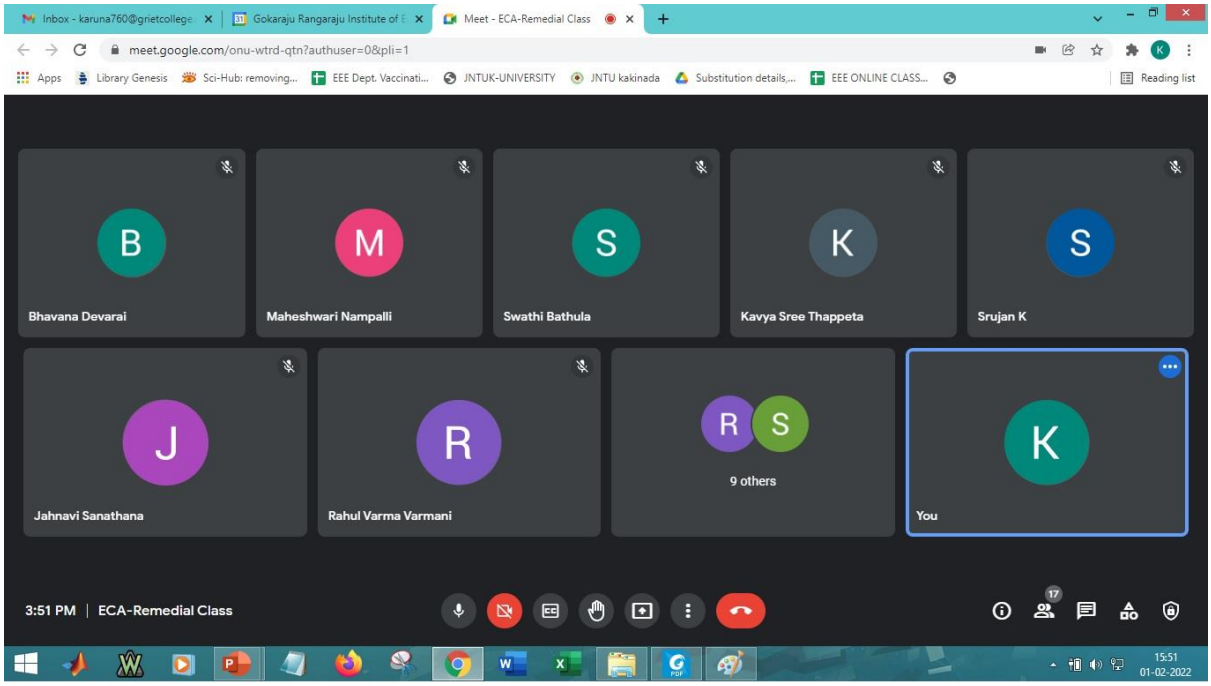
Inbox - karuna760@grietcollege
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Meet - ECA-Remedial Class
meet.google.com/onu-wtrd-qtn?authuser=0&pli=1
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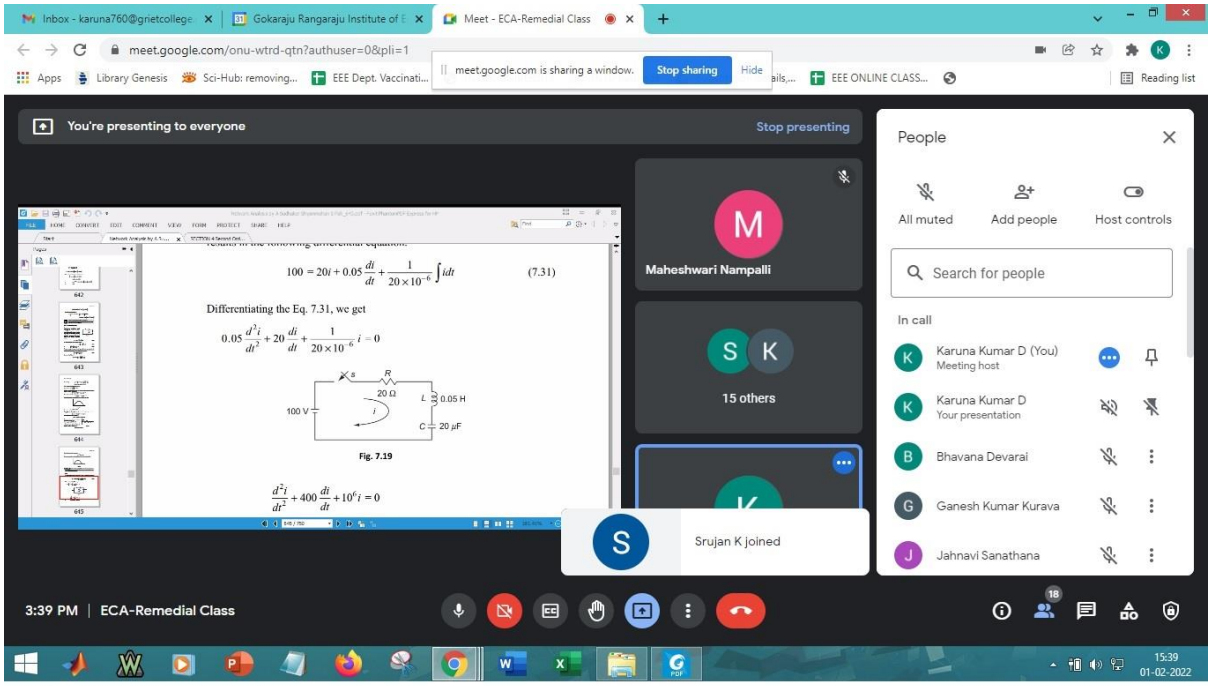
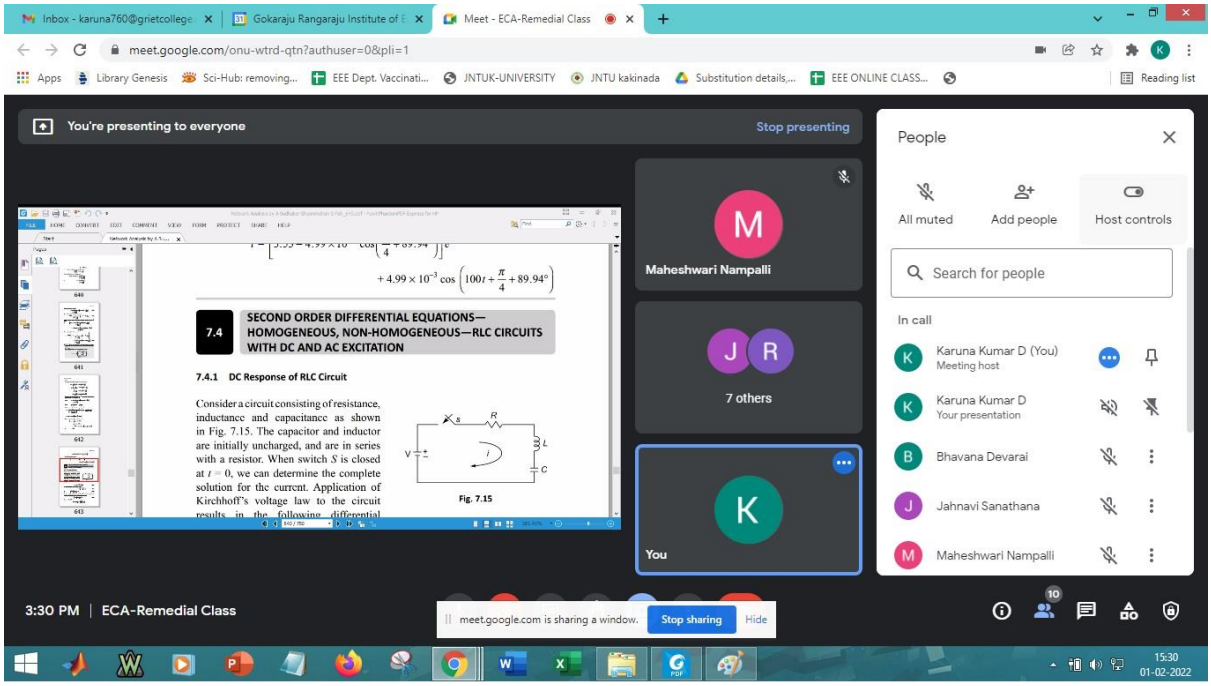
EEE Dept. Vaccinati...
JNTUK-UNIVERSITY
JNTU kakinada
Substitution details,...
EEE ONLINE CLASS...
Reading list
B
Bhavana Devarai
M
Maheshwari Nampalli
S
Swathi Bathula
K
Kavya Sree Thappeta
S
Srujan K
J
Jahnavi Sanathana
R
Rahul Varma Varmani
R S
9 others
K
You
3:51 PM | ECA-Remedial Class
15:51
01-02-2022


Inbox - karuna760@grietcollege
Gokaraju Rangaraju Institute of E
Meet - ECA-Remedial Class
meet.google.com/onu-wtrd-qtn?authuser=0&pli=1
meet.google.com is sharing a window.
Stop sharing
Hide
Apps
Library Genesis
Sci-Hub: removing...
EEE Dept. Vaccinati...
EEE ONLINE CLASS...
Reading list
You're presenting to everyone
Stop presenting
$100 = 20i + 0.05\frac{di}{dt} + \frac{1}{20\times10^{-6}}\int i\,dt$ (7.31)
Differentiating the Eq. 7.31, we get
$0.05\frac{d^2i}{dt^2} + 20\frac{di}{dt} + \frac{1}{20\times10^{-6}}i = 0$
20 Ω
0.05 H
100 V
20 μF
Fig. 7.19
$\frac{d^2i}{dt^2} + 400\frac{di}{dt} + 10^6 i = 0$
M
Maheshwari Nampalli
S K
15 others
S
Srujan K joined
People
All muted
Add people
Host controls
Search for people
In call
Karuna Kumar D (You)
Meeting host
Karuna Kumar D
Your presentation
Bhavana Devarai
Ganesh Kumar Kurava
Jahnavi Sanathana
3:39 PM | ECA-Remedial Class
15:39
01-02-2022


You're presenting to everyone
Stop presenting
7.4
SECOND ORDER DIFFERENTIAL EQUATIONS—HOMOGENEOUS, NON-HOMOGENEOUS—RLC CIRCUITS WITH DC AND AC EXCITATION
7.4.1 DC Response of RLC Circuit
Consider a circuit consisting of resistance, inductance and capacitance as shown in Fig. 7.15. The capacitor and inductor are initially uncharged, and are in series with a resistor. When switch S is closed at t = 0, we can determine the complete solution for the current. Application of Kirchhoff's voltage law to the circuit results in the following differential
Fig. 7.15
Maheshwari Nampalli
7 others
You
People
All muted
Add people
Host controls
Search for people
In call
Karuna Kumar D (You)
Meeting host
Karuna Kumar D
Your presentation
Bhavana Devarai
Jahnavi Sanathana
Maheshwari Nampalli
3:30 PM | ECA-Remedial Class
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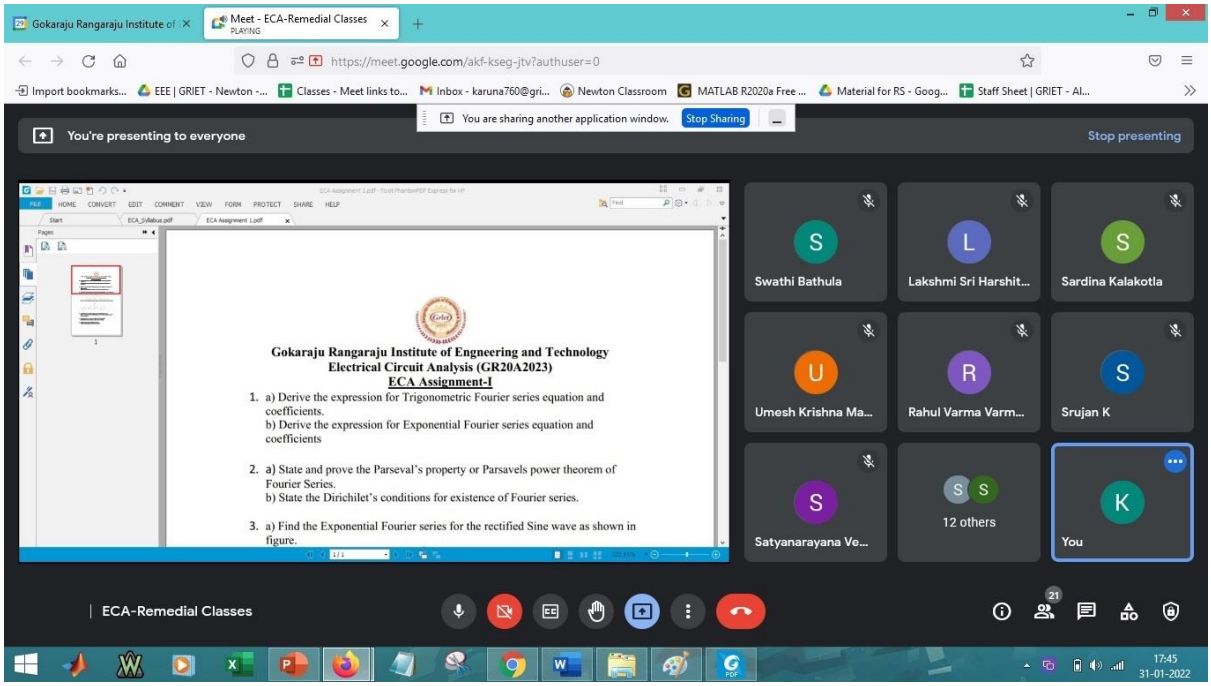
01-02-2022


Meet - ECA-Remedial Classes
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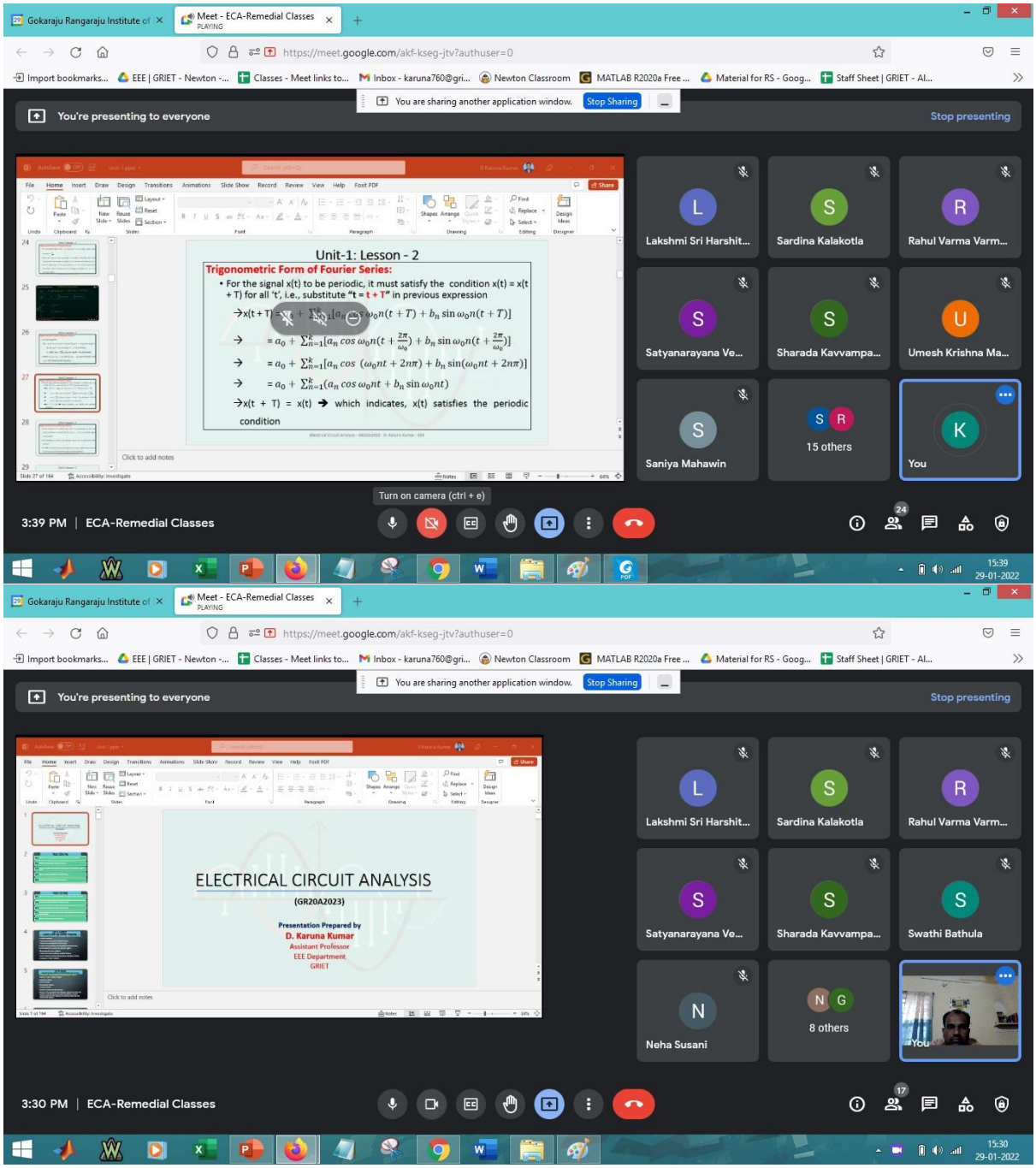
Stop presenting
Gokaraju Rangaraju Institute of Engneering and Technology
Electrical Circuit Analysis (GR20A2023)
ECA Assignment-I
1. a) Derive the expression for Trigonometric Fourier series equation and coefficients.
b) Derive the expression for Exponential Fourier series equation and coefficients
2. a) State and prove the Parseval's property or Parsavels power theorem of Fourier Series.
b) State the Dirichilet's conditions for existence of Fourier series.
3. a) Find the Exponential Fourier series for the rectified Sine wave as shown in figure.
Swathi Bathula
Lakshmi Sri Harshit...
Sardina Kalakotla
Umesh Krishna Ma...
Rahul Varma Varm...
Srujan K
Satyanarayana Ve...
12 others
You
ECA-Remedial Classes
17:45
31-01-2022


Gokaraju Rangaraju Institute of
Meet - ECA-Remedial Classes
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Unit-1: Lesson - 2
Trigonometric Form of Fourier Series:
• For the signal x(t) to be periodic, it must satisfy the condition x(t) = x(t + T) for all 't', i.e., substitute "t = t + T" in previous expression
→x(t + T) = $a_0 + \sum_{n=1}^{k}[a_n \cos \omega_0 n(t+T) + b_n \sin \omega_0 n(t+T)]$
→ $= a_0 + \sum_{n=1}^{k}[a_n \cos \omega_0 n(t + \frac{2\pi}{\omega_0}) + b_n \sin \omega_0 n(t + \frac{2\pi}{\omega_0})]$
→ $= a_0 + \sum_{n=1}^{k}[a_n \cos (\omega_0 nt + 2n\pi) + b_n \sin(\omega_0 nt + 2n\pi)]$
→ $= a_0 + \sum_{n=1}^{k}(a_n \cos \omega_0 nt + b_n \sin \omega_0 nt)$
→x(t + T) = x(t) ➔ which indicates, x(t) satisfies the periodic condition
Lakshmi Sri Harshit...
Sardina Kalakotla
Rahul Varma Varm...
Satyanarayana Ve...
Sharada Kavvampa...
Umesh Krishna Ma...
Saniya Mahawin
15 others
You
Turn on camera (ctrl + e)
3:39 PM | ECA-Remedial Classes
15:39
29-01-2022
Gokaraju Rangaraju Institute of
Meet - ECA-Remedial Classes
PLAYING
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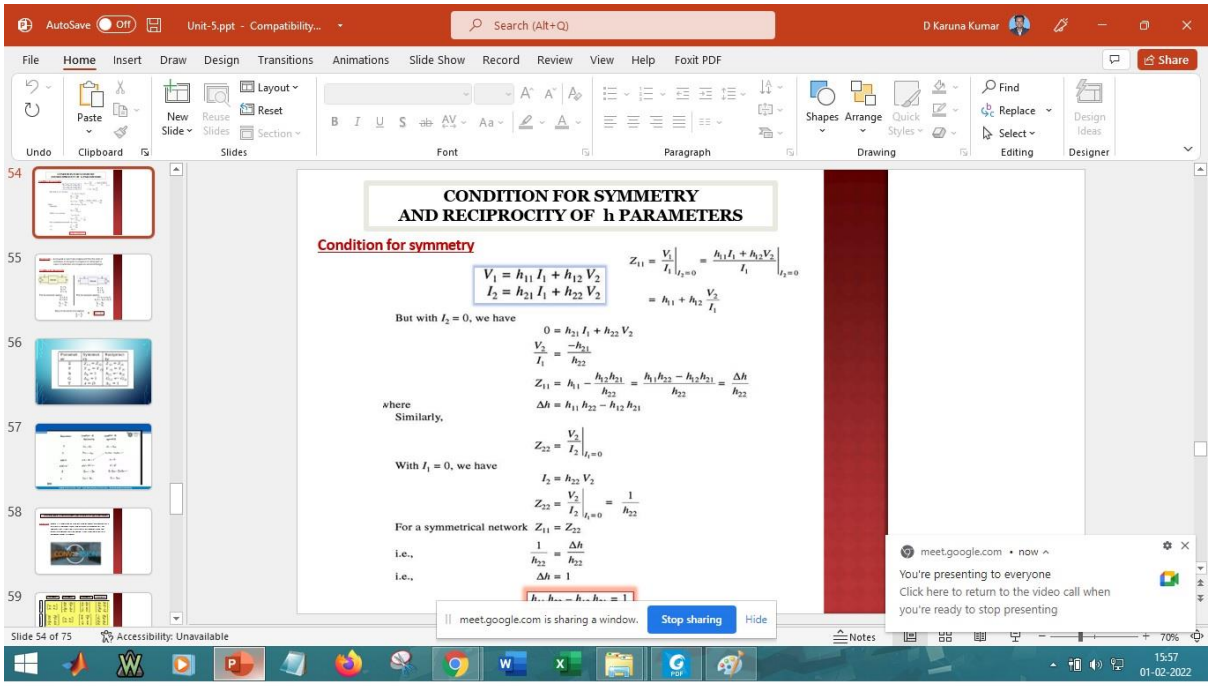
Stop Sharing
You're presenting to everyone
Stop presenting
ELECTRICAL CIRCUIT ANALYSIS
(GR20A2023)
Presentation Prepared by
D. Karuna Kumar
Assistant Professor
EEE Department
GRIET
Lakshmi Sri Harshit...
Sardina Kalakotla
Rahul Varma Varm...
Satyanarayana Ve...
Sharada Kavvampa...
Swathi Bathula
Neha Susani
8 others
You
3:30 PM | ECA-Remedial Classes
15:30
29-01-2022


AutoSave Off
Unit-5.ppt - Compatibility...
Search (Alt+Q)
D Karuna Kumar
File Home Insert Draw Design Transitions Animations Slide Show Record Review View Help Foxit PDF
Share
Paste
New Slide
Reuse Slides
Layout
Reset
Section
Shapes
Arrange
Quick Styles
Find
Replace
Select
Design Ideas
Undo
Clipboard
Slides
Font
Paragraph
Drawing
Editing
Designer
54
55
56
57
58
59
CONDITION FOR SYMMETRY
AND RECIPROCITY OF h PARAMETERS
Condition for symmetry
$V_1 = h_{11} I_1 + h_{12} V_2$
$I_2 = h_{21} I_1 + h_{22} V_2$
$Z_{11} = \left.\frac{V_1}{I_1}\right|_{I_2=0} = \left.\frac{h_{11} I_1 + h_{12} V_2}{I_1}\right|_{I_2=0}$
$= h_{11} + h_{12} \frac{V_2}{I_1}$
But with $I_2 = 0$, we have
$0 = h_{21} I_1 + h_{22} V_2$
$\frac{V_2}{I_1} = \frac{-h_{21}}{h_{22}}$
$Z_{11} = h_{11} - \frac{h_{12} h_{21}}{h_{22}} = \frac{h_{11} h_{22} - h_{12} h_{21}}{h_{22}} = \frac{\Delta h}{h_{22}}$
where $\Delta h = h_{11} h_{22} - h_{12} h_{21}$
Similarly,
$Z_{22} = \left.\frac{V_2}{I_2}\right|_{I_1=0}$
With $I_1 = 0$, we have
$I_2 = h_{22} V_2$
$Z_{22} = \left.\frac{V_2}{I_2}\right|_{I_1=0} = \frac{1}{h_{22}}$
For a symmetrical network $Z_{11} = Z_{22}$
i.e., $\frac{1}{h_{22}} = \frac{\Delta h}{h_{22}}$
i.e., $\Delta h = 1$
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Click here to return to the video call when you're ready to stop presenting
Slide 54 of 75
Accessibility: Unavailable
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70%
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01-02-2022

Report on Remedial Classes

This is to inform you that Finishing school of GRIET is conducting Remedial classes for B.Tech II year students to clear their backlogs.

Details are

1. Remedial classes are conducted in different Subjects to support the Students in clearing their backlogs. As the first step, classes are held for Final year and Marched out batches in three different schedules. Students were informed through SMS. Students shown lot of interest .Faculty gave tips as well as material for the students.80-90% of the students who have attended got benefit and they passed in the exams.

2. The classes are aimed to help the students having a maximum of two or more backlogs in previous academic year so that they will get the degree as per their academic calendar. Students preferred material and few tips as they were busy in Projects. For some subjects they came and attentive.
3. The sessions for II year students are to prevent failure rate and thereby increasing transition rate. The subjects are selected based on I-semester results. To increase attendance for the classes a brief motivation lecture is organized with the key note address by HOD.

   The following shows the courses for which Remedial classes are held and the Transition rate in such course:

S.No	Course	No.of students attended	No.of students passed	Transition rate
1.	Electrical Circuit Analysis	29	21	72.41
2.	Electromagnetic Fields	31	14	45.16

Gokaraju Rangaraju Institute of Engineering and Technology

Electrical and Electronics Engineering

Remedial Classes-II B.Tech I Sem-2021-22

Remedial Classes- Results

Sl.No	Roll.No	Subject Code	Subject Name	Result
1	20241A0201	GR20A2023	Electrical Circuit	Pass
2	20241A0202	GR20A2023	Electrical Circuit	Pass
3	20241A0203	GR20A2023	Electrical Circuit	Pass
4	20241A0207	GR20A2023	Electrical Circuit	Pass
5	20241A0209	GR20A2023	Electrical Circuit	Pass
6	20241A0210	GR20A2023	Electrical Circuit	Pass
7	20241A0213	GR20A2023	Electrical Circuit	Fail
8	20241A0214	GR20A2023	Electrical Circuit	Pass
9	20241A0219	GR20A2023	Electrical Circuit	Pass
10	20241A0221	GR20A2023	Electrical Circuit	Pass
11	20241A0222	GR20A2023	Electrical Circuit	Pass
12	20241A0225	GR20A2023	Electrical Circuit	Fail
13	20241A0226	GR20A2023	Electrical Circuit	Pass
14	20241A0227	GR20A2023	Electrical Circuit	Pass
15	20241A0228	GR20A2023	Electrical Circuit	Fail
16	20241A0231	GR20A2023	Electrical Circuit	Fail
17	20241A0234	GR20A2023	Electrical Circuit	Pass
18	20241A0236	GR20A2023	Electrical Circuit	Pass
19	20241A0237	GR20A2023	Electrical Circuit	Pass
20	20241A0243	GR20A2023	Electrical Circuit	Pass
21	20241A0244	GR20A2023	Electrical Circuit	Fail
22	20241A0250	GR20A2023	Electrical Circuit	Fail
23	20241A0252	GR20A2023	Electrical Circuit	Pass
24	20241A0255	GR20A2023	Electrical Circuit	Fail
25	20241A0256	GR20A2023	Electrical Circuit	Pass
26	20241A0257	GR20A2023	Electrical Circuit	Pass
27	21245A0207	GR20A2023	Electrical Circuit	Fail
28	21245A0208	GR20A2023	Electrical Circuit	Pass
29	21245A0209	GR20A2023	Electrical Circuit	Pass
Sl.No	**Roll.No**	**Subject Code**	**Subject Name**	**Result**
1	20241A0201	GR20A2023	Electromagnetic Fields	Pass
2	20241A0207	GR20A2023	Electromagnetic Fields	Fail
3	20241A0208	GR20A2023	Electromagnetic Fields	Pass
4	20241A0209	GR20A2023	Electromagnetic Fields	Fail
5	20241A0212	GR20A2023	Electromagnetic Fields	Pass
6	20241A0213	GR20A2023	Electromagnetic Fields	Fail
7	20241A0214	GR20A2023	Electromagnetic Fields	Fail
8	20241A0219	GR20A2023	Electromagnetic Fields	Fail
9	20241A0220	GR20A2023	Electromagnetic Fields	Pass
10	20241A0221	GR20A2023	Electromagnetic Fields	Pass
11	20241A0225	GR20A2023	Electromagnetic Fields	Fail
12	20241A0227	GR20A2023	Electromagnetic Fields	Pass
13	20241A0228	GR20A2023	Electromagnetic Fields	Fail
14	20241A0231	GR20A2023	Electromagnetic Fields	Fail
15	20241A0234	GR20A2023	Electromagnetic Fields	Pass
16	20241A0236	GR20A2023	Electromagnetic Fields	Fail
17	20241A0238	GR20A2023	Electromagnetic Fields	Pass
18	20241A0241	GR20A2023	Electromagnetic Fields	Pass
19	20241A0242	GR20A2023	Electromagnetic Fields	Pass
20	20241A0244	GR20A2023	Electromagnetic Fields	Fail
21	20241A0245	GR20A2023	Electromagnetic Fields	Pass

22	20241A0250	GR20A2023	Electromagnetic Fields	Fail
23	20241A0252	GR20A2023	Electromagnetic Fields	Fail
24	20241A0253	GR20A2023	Electromagnetic Fields	Pass
25	20241A0255	GR20A2023	Electromagnetic Fields	Fail
26	20241A0256	GR20A2023	Electromagnetic Fields	Fail
27	21245A0202	GR20A2023	Electromagnetic Fields	Pass
28	21245A0203	GR20A2023	Electromagnetic Fields	Pass
29	21245A0207	GR20A2023	Electromagnetic Fields	Fail
30	21245A0208	GR20A2023	Electromagnetic Fields	Fail
31	21245A0209	GR20A2023	Electromagnetic Fields	Fail