LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING, (AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
ISO 21001 : 2018, 50001 : 2018, 14001: 2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT
COURSE HANDOUT
PART-A

Name of Course Instructor : Dr. T.Radha Rani
Course Name & Code : Complex Variables & Numerical Methods & 23FE07
L-T-P Structure : 3-0-0   **Credits:3**
Program/Sem/Sec : B.Tech/III sem/EEE-A   **A.Y.:** 2025 – 26.
COURSE COORDINATOR : Dr. T.Radha Rani
PREREQUISITE : Basics of Complex Number Theory

COURSE OBJECTIVES :
- To elucidate the different numerical methods to solve non-linear algebraic equations.
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To familiarize the complex variables.
- To equip the students to solve application problems in their disciplines.

COURSE OUTCOMES (COs)
        After completion of the course, the student will be able to
CO1: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (**L3**)
CO2: Apply numerical techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (**L3**)
CO3: Apply Cauchy Riemann equations to complex functions in order to determine whether a given continuous function is analytic (**L3**)
CO4: Evaluate the Taylor and Laurent expansions of simple functions, determining the nature of the singularities and calculating residues. Make use of the Cauchy residue theorem to evaluate certain integrals (**L3**)
CO5: Explain properties of various types of conformal mappings (**L5**)

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	2	-	-	-	-	-	-	-	1
CO2	3	2	-	2	-	-	-	-	-	-	-	1
CO3	3	2	1	-	-	-	-	-	-	-	-	1
CO4	3	2	1	-	-	-	-	-	-	-	-	1
CO5	3	2	1	-	-	-	-	-	-	-	-	1

Note: Enter Correlation Levels **1** or **2** or **3**. If there is no correlation, **put '-'**
    1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:
T1   Dr. B.S. Grewal, "Higher Engineering Mathematics", 44thEdition, Khanna Publishers.
T2   Michael Greenberg, *"Advanced Engineering Mathematics"*, 2 Edition, Pearson Publishers.

BOS APPROVED REFERENCE BOOKS:
R1   **ErwinKreyszig,** AdvancedEngineeringMathematics,10thEdition,Wiley -India.
R2   **B.V.Ramana,** HigherEngineeringMathematics,2007Edition,TataMc.GrawHill Education.
R3   **StevenC.Chapra,** AppliedNumerical Methods withMATLAB for Engineeringand Science, Tata Mc. Graw Hill Education.
R4   **M.K.Jain,S.R.K.IyengarandR.K.Jain,**NumericalMethodsforScientificand EngineeringComputation,NewAge InternationalPublications.
R5   **J. W. Brown and R. V. Churchill**, Complex Variables and Applications, 9th edition, Mc-Graw Hill, 2013.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course Course outcomes and Program outcomes	1	30-06-25		TLM2			

UNIT-I: Iterative Methods

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
2.	Bisection Method	1	01-07-25		TLM1	CO1	T1,T2	
3.	Bisection Method	1	03-07-25		TLM1	CO1	T1,T2	
4.	Secant Method	1	04-07-25		TLM1	CO1	T1,T2	
5.	Secant Method	1	07-07-25		TLM1	CO1	T1,T2	
6.	Method of False Position Method	1	08-07-25		TLM1	CO1	T1,T2	
7.	Method of False Position Method	1	10-07-25		TLM1	CO1	T1,T2	
8.	General Iteration Method	1	11-07-25		TLM1	CO1	T1,T2	
9.	Newton Raphson method	1	14-07-25		TLM1	CO1	T1,T2	
10.	Newton Raphson method for simultaneous equations	1	15-07-25		TLM1	CO1	T1,T2	
11.	Newton Forward Interpolation method	1	17-07-25		TLM1	CO1	T1,T2	
12.	Newton Forward Interpolation method	1	18-07-25		TLM1	CO1	T1,T2	
13.	Newton Backward Interpolation method	1	21-07-25		TLM1	CO1	T1,T2	
14.	Lagranze's Interpolation	1	22-07-25		TLM1	CO1	T1,T2	
15.	Lagranze's Interpolation	1	24-07-25		TLM1	CO1	T1,T2	
16.	Tutorial-I	1	25-07-25		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		16				No. of classes taken:		

UNIT-II: Numerical integration, Solution of ordinary differential equations with initial conditions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to Unit – II	1	28-07-25		TLM1	CO2	T1,T2	
18.	Trapezoidal Rule	1	29-07-25		TLM1	CO2	T1,T2	
19.	Trapezoidal Rule	1	31-07-25		TLM1	CO2	T1,T2	
20.	Simpson's 1/3 Rule	1	01-08-25		TLM1	CO2	T1,T2	
21.	Simpson's 1/3 Rule	1	04-08-25		TLM1	CO2	T1,T2	
22.	Simpson's 1/3 Rule	1	05-08-25		TLM1	CO2	T1,T2	
23.	Simpson's 3/8 Rule	1	07-08-25		TLM1	CO2	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
24.	Simpson's 3/8 Rule	1	08-08-25		TLM1	CO2	T1,T2	
25.	Taylor Series Method	1	11-08-25		TLM1	CO2	T1,T2	
26.	Taylor Series Method	1	12-08-25		TLM1	CO2	T1,T2	
27.	Picard's Method	1	14-08-25		TLM1	CO2	T1,T2	
28.	Euler's Method	1	18-08-25		TLM1	CO2	T1,T2	
29.	Runge Kutta Second order method	1	19-08-25		TLM1	CO2	T1,T2	
30.	Milne's Predictor and Corrector method	1	21-08-25		TLM1	CO2	T1,T2	
31.	TUTORIAL - II	1	22-08-25		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

I MID EXAMINATIONS (25-08-25 TO 30-08-25)

UNIT-III: Functions of Complex Variable and Complex Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Continuity	1	01-09-25		TLM1	CO3	T1,T2	
33.	Differentiability	1	02-09-25		TLM1	CO3	T1,T2	
34.	Analytic functions	1	04-09-25		TLM1	CO3	T1,T2	
35.	Cauchy Riemann equations in Cartesian and Polar Coordinates	1	05-09-25		TLM1	CO3	T1,T2	
36.	Cauchy Riemann equations in Cartesian and Polar Coordinates	1	08-09-25		TLM1	CO3	T1,T2	
37.	Milne Thompson method	1	09-09-25		TLM1	CO3	T1,T2	
38.	Milne Thompson method	1	11-09-25		TLM1	CO3	T1,T2	
39.	Line Integration	1	12-09-25		TLM1	CO3	T1,T2	
40.	Cauchy's Integral theorem – problems	1	15-09-25		TLM1	CO3	T1,T2	
41.	TUTORIAL - III	1	16-09-25		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		10			No. of classes taken:			

UNIT-IV: Series Expansion and Residue Theorem

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Radius of Convergence	1	18-09-25		TLM1	CO4	T1,T2	
43.	Expansion of function in Taylor series	1	19-09-25		TLM1	CO4	T1,T2	
44.	Expansion of function in Maclaurin's series	1	22-09-25		TLM1	CO4	T1,T2	
45.	Expansion of function in Laurent series	1	23-09-25		TLM1	CO4	T1,T2	
46.	Singularities and types	1	25-09-25		TLM1	CO4	T1,T2	
47.	Poles and Residues	1	26-09-25		TLM1	CO4	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
48.	Residue theorem problems	1	06-10-25		TLM1	CO4	T1,T2	
49.	Evaluation of real integrals of Type-II	1	07-10-25		TLM1	CO4	T1,T2	
50.	Evaluation of real integrals of Type-II	1	09-10-25		TLM1	CO4	T1,T2	
51.	TUTORIAL - IV	1	10-10-25		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		10		No. of classes taken:				

UNIT-V: Conformal Mapping

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Transformation by e^z	1	13-10-25		TLM1	CO5	T1,T2	
53.	Transformation by z^2, z^n (n positive integer),	1	14-10-25		TLM1	CO5	T1,T2	
54.	Transformation by sinz, cosz, z+az	1	16-10-25		TLM1	CO5	T1,T2	
55.	Translation and Rotation	1	17-10-25		TLM1	CO5	T1,T2	
56.	Translation and Rotation	1	20-10-25		TLM1	CO5	T1,T2	
57.	Inversion and Bilinear Transformation	1	23-10-25		TLM1	CO5	T1,T2	
58.	Fixed point, Cross Ratio, Properties	1	24-10-25		TLM1	CO5	T1,T2	
59.	Invariant points and cross ratio property	1	27-10-25		TLM1	CO5	T1,T2	
60.	Bilinear transformation mapping for three given points	1	28-10-25		TLM1	CO5	T1,T2	
61.	TUTORIAL - V	1	31-10-25		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		10		No. of classes taken:				

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
62	Argument Principle and Rouche's theorem	1	30-10-25		TLM2	CO3	T1,T2	
No. of classes		1		No. of classes taken:				

II MID EXAMINATIONS (03-11-25 TO 08-11-25)

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C
EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10

Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr.T.Radha Rani	**Dr.T.Radha Rani**	**Dr. A. Rami Reddy**	**Dr. T.Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
PART-A

Name of Course Instructor : Dr.K.BHANU LAKSHMI
Course Name & Code : Complex Variables & Numerical Methods & 23FE07
L-T-P Structure : 3-0-0   **Credits: 3**
Program/Sem/Sec : B.Tech/III sem/EEE-B   **A.Y.:**2025– 26.
COURSE COORDINATOR : Dr. T.Radha Rani
PREREQUISITE : Basics of Complex Number Theory

COURSE OBJECTIVES:
- To elucidate the different numerical methods to solve non-linear algebraic equations.
- To disseminate the use of different numerical techniques for carrying out numerical integration.
- To familiarize the complex variables.
- To equip the students to solve application problems in their disciplines.

COURSE OUTCOMES (COs)
After completion of the course, the student will be able to

CO1: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (**L3**)

CO2: Apply numerical techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (**L3**)

CO3: Apply Cauchy Riemann equations to complex functions in order to determine whether a given continuous function is analytic (**L3**)

CO4: Evaluate the Taylor and Laurent expansions of simple functions, determining the nature of the singularities and calculating residues. Make use of the Cauchy residue theorem to evaluate certain integrals (**L3**)

CO5: Explain properties of various types of conformal mappings **(L5)**

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	2	-	-	-	-	-	-	-	1
CO2	3	2	-	2	-	-	-	-	-	-	-	1
CO3	3	2	1	-	-	-	-	-	-	-	-	1
CO4	3	2	1	-	-	-	-	-	-	-	-	1
CO5	3	2	1	-	-	-	-	-	-	-	-	1

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
    1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 44th Edition, Khanna Publishers.

T2 Michael Greenberg, *"Advanced Engineering Mathematics"*, 2 Edition, Pearson Publishers.

BOS APPROVED REFERENCE BOOKS:

R1 ErwinKreyszig, AdvancedEngineeringMathematics,10thEdition,Wiley -India.

R2 **B.V.Ramana,**
HigherEngineeringMathematics,2007Edition,TataMc.GrawHillEducation.

R3 **StevenC.Chapra,** AppliedNumerical Methods withMATLAB for
Engineeringand Science, Tata Mc. Graw H¡11 Education.

R4 **M.K.Jain,S.R.K.Iyeng
arandR.K.Jain,**NumericalMethodsforScientificandEngineeringComputation,NewAg
eInternationalPublications.

R5 **J. W. Brown and R. V. Churchi**l, Complex Variables and Applications,
9th edition, Mc-Graw Hill, 2013.

Part-B
COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	30-06-25		TLM2			

UNIT-I: Iterative Methods

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
2.	Bisection Method	1	02-07-25		TLM1	CO1	T1,T2	
3.	Bisection Method	1	03-07-25		TLM1	CO1	T1,T2	
4.	Secant Method	1	05-07-25		TLM1	CO1	T1,T2	
5.	Secant Method	1	07-07-25		TLM1	CO1	T1,T2	
6.	Method of False Position Method	1	09-07-25		TLM1	CO1	T1,T2	
7.	Method of False Position Method	1	10-07-25		TLM1	CO1	T1,T2	
8.	General Iteration Method	1	12-07-25		TLM1	CO1	T1,T2	
9.	Newton Raphson method	1	14-07-25		TLM1	CO1	T1,T2	
10.	Newton Raphson method for simultaneous equations	1	16-07-25		TLM1	CO1	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
11.	Newton Forward Interpolation method	1	17-07-25		TLM1	CO1	T1,T2	
12.	Newton Forward Interpolation method	1	19-07-25		TLM1	CO1	T1,T2	
13.	Newton Backward Interpolation method	1	21-07-25		TLM1	CO1	T1,T2	
14.	Lagranze's Interpolation	1	23-07-25		TLM1	CO1	T1,T2	
15.	Lagranze's Interpolation	1	24-07-25		TLM1	CO1	T1,T2	
16.	Tutorial-I	1	28-07-25		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		16			No. of classes taken:			

UNIT-II: Numericalintegration, Solution of ordinary differential equations with initial conditions

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to Unit – II	1	30-07-25		TLM1	CO2	T1,T2	
18.	Trapezoidal Rule	1	31-07-25		TLM1	CO2	T1,T2	
19.	Trapezoidal Rule	1	02-08-25		TLM1	CO2	T1,T2	
20.	Simpson's 1/3 Rule	1	04-08-25		TLM1	CO2	T1,T2	
21.	Simpson's 1/3 Rule	1	06-08-25		TLM1	CO2	T1,T2	
22.	Simpson's 1/3 Rule	1	07-08-25		TLM1	CO2	T1,T2	
23.	Simpson's 3/8 Rule	1	09-08-25		TLM1	CO2	T1,T2	
24.	Simpson's 3/8 Rule	1	11-08-25		TLM1	CO2	T1,T2	
25.	Taylor Series Method	1	13-08-25		TLM1	CO2	T1,T2	
26.	Taylor Series Method	1	13-08-25		TLM1	CO2	T1,T2	
27.	Picard's Method	1	14-08-25		TLM1	CO2	T1,T2	
28.	Euler's Method	1	18-08-25		TLM1	CO2	T1,T2	
29.	Runge Kutta Second order method	1	20-08-25		TLM1	CO2	T1,T2	
30.	Milne's Predictor and Corrector method	1	21-08-25		TLM1	CO2	T1,T2	
31.	TUTORIAL - II	1	23-08-25		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

I MID EXAMINATIONS (25-08-25 TO 30-08-25)

UNIT-III: Functions of Complex Variable and Complex Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Continuity	1	01-09-25		TLM1	CO3	T1,T2	
33.	Differentiability	1	03-09-25		TLM1	CO3	T1,T2	
34.	Analytic functions	1	04-09-25		TLM1	CO3	T1,T2	
35.	Cauchy Riemann equations in Cartesian and Polar Coordinates	1	06-09-25		TLM1	CO3	T1,T2	
36.	Cauchy Riemann equations in Cartesian and Polar Coordinates	1	08-09-25		TLM1	CO3	T1,T2	
37.	Milne Thompson method	1	10-09-25		TLM1	CO3	T1,T2	
38.	Milne Thompson method	1	11-09-25		TLM1	CO3	T1,T2	
39.	Line Integration	1	13-09-25		TLM1	CO3	T1,T2	
40.	Cauchy's Integral theorem – problems	1	15-09-25		TLM1	CO3	T1,T2	
41.	TUTORIAL - III	1	17-09-25		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III	10				No. of classes taken:			

UNIT-IV: Series Expansion and Residue Theorem

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Radius of Convergence	1	18-09-25		TLM1	CO4	T1,T2	
43.	Expansion of function in Taylor series	1	20-09-25		TLM1	CO4	T1,T2	
44.	Expansion of function in Maclaurin's series	1	22-09-25		TLM1	CO4	T1,T2	
45.	Expansion of function in Laurent series	1	24-09-25		TLM1	CO4	T1,T2	
46.	Singularities and types	1	25-09-25		TLM1	CO4	T1,T2	
47.	Poles and Residues	1	27-09-25		TLM1	CO4	T1,T2	
48.	Residue theorem problems	1	29-09-25		TLM1	CO4	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
49.	Evaluation of real integrals of Type-II	1	06-10-25		TLM1	CO4	T1,T2	
50.	Evaluation of real integrals of Type-II	1	08-10-25		TLM1	CO4	T1,T2	
51.	TUTORIAL - IV	1	09-10-25		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		10			No. of classes taken:			

UNIT-V: Conformal Mapping

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
52.	Transformation by e^z	1	13-10-25		TLM1	CO5	T1,T2	
53.	Transformation by z^2, z^n (n positiveinteger),	1	15-10-25		TLM1	CO5	T1,T2	
54.	Transformation by $\sin z, \cos z, z+az$	1	16-10-25		TLM1	CO5	T1,T2	
55.	Translation and Rotation	1	18-10-25		TLM1	CO5	T1,T2	
56.	Translation and Rotation	1	20-10-25		TLM1	CO5	T1,T2	
57.	Inversion and Bilinear Transformation	1	22-10-25		TLM1	CO5	T1,T2	
58.	Fixed point, Cross Ratio, Properties	1	23-10-25		TLM1	CO5	T1,T2	
59.	Invariant points and cross ratio property	1	25-10-25		TLM1	CO5	T1,T2	
60.	Bilinear transformation mapping for three given points	1	27-10-25		TLM1	CO5	T1,T2	
61.	TUTORIAL - V	1	30-10-25		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
62	Argument Principle and Rouche's theorem	1	29-10-25		TLM2	CO3	T1,T2	
No. of classes		1			No. of classes taken:			

II MID EXAMINATIONS (03-11-25 TO 08-11-25)

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C
EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual land as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give

	and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr.K.Bhanu Lakshmi	**Dr.T.Radha Rani**	**Dr. A. Rami Reddy**	**Dr. T.Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF EEE

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. M. Uma Vani
Course Name & Code   : Universal Human Values II-Understanding Harmony and Ethical Human Conduct (23HS01)
L-T-P Structure   : 3-0-0   **Credits:** 3
Program/Sem/Sec   : B.Tech/III/A   **A.Y.:** 2025-26

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Describe the terms like Natural Acceptance, Happiness and prosperity (L2)
CO2	Identify one's self, and one's surroundings (family, society, nature) (L2)
CO3	Relate human values with human relationship and human society. (L2)
CO4	Illustrate the need for universal human values and harmonious existence (L2)
CO5	Develop as socially and ecologically responsible engineers (L3)

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	-	-	2	2	2	2	-	-	2	2	1	-
CO2	1	-	1	-	-	2	2	2	2	-	-	2	2	-	-
CO3	1	-	1	-	-	3	3	3	3	-	-	3	1	-	-
CO4	1	-	1	-	-	3	3	3	3	-	-	3	3	2	-
CO5	1	-	1	-	-	3	3	3	3	-	-	3	3	3	-
1 - Low					**2 –Medium**					**3 - High**					

TEXTBOOKS:
T1 R R Gaur, R Singal, G P Bagaria, "Human values and Professional Ethics", Excel Books, New Delhi,2010.

REFERENCE BOOKS:
R1 Jeevan Vidya: Ek Parichaya, A.Nagaraj, Jeevan Vidya Prakashan, Amarkantak,1999
R2 Human Values, A N Tripathi, New Age Publishers, New Delhi, 2004
R3 The story of my experiments with Truth, Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN-A/Sec)

(Commencement of Classwork:30-6-2025)

UNIT-I: Introduction to Value Education

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	COs/POs; Introduction to course	1	1-7-2025		TLM1/2	
2.	Right Understanding, Relationship and Physical Facility	1	3-7-2025		TLM1/2	
3.	Understanding Value Education	1	4-7-2025		TLM1/2	
4.	Practice Session **PS1** Sharing about Oneself	1	5-7-2025		**TLM3**	
5.	Self-exploration as the Process for Value Education	1	8-7-2025		TLM1/2	
6.	A look at basic Human Aspirations	1	10-7-2025		TLM1/2	
7.	Continuous Happiness and Prosperity– the Basic Human Aspirations	1	11-7-2025		TLM1/2	
8.	Practice Session **PS2** Exploring Human Consciousness	1	15-7-2025		**TLM3**	
9.	Happiness and Prosperity – Current Scenario	1	17-7-2025		TLM1/2	
10.	Method to Fulfill the Basic Human Aspirations	1	18-7-2025		TLM1/2	
11.	Practice Session **PS3** Exploring Natural Acceptance	1	19-7-2025		**TLM3**	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Harmony in the Human Being

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Understanding Human being as the Co-existence of the self and the body	1	22-7-2025		TLM1/2	
13.	Distinguishing between the Needs of the self and the body	1	24-7-2025		TLM1/2	
14.	Practice Session **PS4** Exploring the difference of Needs of self and body.	1	25-7-2025		**TLM3**	
15.	The body as an Instrument of the self	1	, 26-7-2025		TLM1/2	
16.	Understanding Harmony in the self	1	29-7-2025		TLM1/2	
17.	Practice Session **PS5** Exploring Sources of Imagination in the self	1	31-7-2025		**TLM3**	
18.	Harmony of the self with the body	1	1-8-2025		TLM1/2	
19.	Programme to ensure self-regulation and Health	1	2-8-2025		TLM1/2	
20.	Practice Session **PS6** Exploring Harmony of self with the body	1	5-8-2025		**TLM3**	
21.	**Quiz**	1	7-8-2025		**TLM3**	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT III: Harmony in the Family and Society

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Harmony in the Family – the Basic Unit of Human Interaction	1	8-8-2025 12-8-2025		TLM1/2	
23.	'Trust' – the Foundational Value in Relationship	1	14-8-2025		TLM1/2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Practice Session **PS7** Exploring the Feeling of Trust	1	16-8-2025		**TLM3**	
25.	'Respect' – as the Right Evaluation	1	19-8-2025		TLM1/2	
26.	Practice Session **PS8** Exploring the Feeling of Respect	1	21-8-2025		**TLM3**	
27.	Other Feelings, Justice in Human-to-Human Relationship	1	22-8-2025		TLM1/2	
28.	Understanding Harmony in the Society	1	23-8-2025		TLM1/2	
29.	Vision for the Universal Human Order	1	2-9-2025		TLM1/2	
30.	Practice Session **PS9** Exploring Systems to fulfil Human Goal	1	4-9-2025		**TLM3**	
31.	**Quiz**	1	5-9-2025		**TLM3**	

No. of classes required to complete UNIT-III:10	No. of classes taken:

UNIT-IV: Harmony in the Nature/Existence

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Understanding Harmony in the Nature	1	6-9-2025		TLM1/2	
33.	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	1	9-9-2025		TLM1/2	
34.	Practice Session **PS10** Exploring the Four Orders of Nature	1	11-9-2025		**TLM3**	
35.	Realizing Existence as Co-existence at All Levels	1	12-9-2025		TLM1/2	
36.	The Holistic Perception of Harmony in Existence	1	16-9-2025		TLM1/2	
37.	Practice Session **PS11** Exploring Co-existence in Existence.	1	18-9-2025,		**TLM3**	
38.	**Project**	1	19-9-2025		**TLM6**	
39.	**Quiz**	1	20-9-2025		**TLM3**	

No. of classes required to complete UNIT-IV: 8	No. of classes taken:

UNIT-V: Implications of the Holistic Understanding – a Look at Professional Ethics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Natural acceptance of human values	1	23-9-2025		TLM1/2	
41.	Definitiveness of ethical human conduct	1	3-10-2025		TLM1/2	
42.	Practice Session **PS12** Exploring Ethical Human Conduct	1	4-10-2025		**TLM3**	
43.	A Basis for Humanistic Education, Humanistic Constitution and Universal Human	1	7-10-2025		TLM1/2	
44.	Competence in professional ethics	1	9-10-2025		TLM1/2	
45.	Practice Session **PS13** Exploring Humanistic Models in Education	1	10-10-2025		**TLM3**	
46.	Holistic Technologies, Production Systems and Management Models-Typical Case studies	1	14-10-2025		TLM1/2	
47.	Strategies for Transition towards Value-based Life and Profession	1	16-10-2025		TLM1/2	
48.	Practice Session **PS14** Exploring Steps of Transition	1	17-10-2025		**TLM3**	

	towards Universal Human Order					
49.	**Project**	1	18-10-2025		**TLM6**	
50.	**Project**	1	21-10-2025		**TLM6**	
51.	**Quiz**	1	23-10-2025		**TLM3**	
52.	**Revision**	6	24-10-2025 to 1-11-2025		TLM1/2	

No. of classes required to complete UNIT-V: 12	No. of classes taken:
Mid-I from 25-8-2025 to 30-8-2025 **Mid-II from 3-11-2025 to 8-11-2025**	

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/ MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C
EVALUATION PROCESS (R20 Regulation)

Evaluation Task	Marks
Assignment-I [Units-I, II & UNIT-III (Half of the Syllabus)]	A1=5
I-Descriptive Examination [Units-I, II & UNIT-III (Half of the Syllabus)]	D1=15
I-Short Answer Examination [Units-I, II & UNIT-III (Half of the Syllabus)]	SA1=10
Assignment-II [Unit-III (Remaining Half of the Syllabus), IV & V]	A2=5
II- Descriptive Examination [UNIT-III (Remaining Half of the Syllabus), IV & V]	D2=15
II- Short Answer Examination [UNIT-III (Remaining Half of the Syllabus), IV & V]	SA2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): D+SA+A	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D
PROGRAMME OUTCOMES (POs)

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess

	societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO 1	Specify, design, and analyze systems that efficiently generate, transmit and distribute electrical power.
PSO 2	Design and analyze electrical machines, modern drive and lighting systems.
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems.
PSO 4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Co-Ordinator	Module Coordinator	HoD
Name of the Faculty	Dr.M.UmaVani	Dr.	Dr.G.Nageswar Rao	Dr.P.Sobha Rani
Signature				
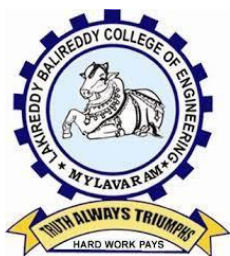
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DEPARTMENT OF EEE

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. P.Sobha Rani
Course Name & Code : Universal Human Values II-Understanding Harmony and Ethical Human Conduct (23HS01)
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech/III/B **A.Y.: 2025-26**

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To become more aware of themselves, and their surroundings (family, society, nature); they would become more responsible in life, and in handling problems with sustainable solutions, while keeping human relationships and human nature in mind.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Describe the terms like Natural Acceptance, Happiness and prosperity (L2)
CO2	Identify one's self, and one's surroundings (family, society, nature) (L2)
CO3	Relate human values with human relationship and human society. (L2)
CO4	Illustrate the need for universal human values and harmonious existence (L2)
CO5	Develop as socially and ecologically responsible engineers (L3)

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	1	-	-	2	2	2	2	-	-	2	2	1	-
CO2	1	-	1	-	-	2	2	2	2	-	-	2	2	-	-
CO3	1	-	1	-	-	3	3	3	3	-	-	3	1	-	-
CO4	1	-	1	-	-	3	3	3	3	-	-	3	3	2	-
CO5	1	-	1	-	-	3	3	3	3	-	-	3	3	3	-
1 - Low					**2 –Medium**					**3 - High**					

TEXTBOOKS:

T1 R R Gaur, R Singal, G P Bagaria, "Human values and Professional Ethics", Excel Books, New Delhi,2010.

REFERENCE BOOKS:

R1 Jeevan Vidya: Ek Parichaya, A.Nagaraj, Jeevan Vidya Prakashan, Amarkantak,1999
R2 Human Values, A N Tripathi, New Age Publishers, New Delhi, 2004
R3 The story of my experiments with Truth, Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN-A/Sec)

(Commencement of Classwork:30-6-2025)

UNIT-I: Introduction to Value Education

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	COs/POs; Introduction to course	1	30.6.25		TLM2	
2.	Right Understanding, Relationship and Physical Facility	1	1.7.25		TLM2	
3.	Understanding Value Education	1	2.7.25		TLM2	
4.	Practice Session **PS1** Sharing about Oneself	1	4.7.25		TLM3	
5.	Self-exploration as the Process for Value Education	1	7.7.25		TLM2	
6.	A look at basic Human Aspirations	1	8.7.25		TLM2	
7.	Continuous Happiness and Prosperity– the Basic Human Aspirations	1	9.7.25		TLM2	
8.	Practice Session **PS2** Exploring Human Consciousness	1	11.7.25		TLM3	
9.	Happiness and Prosperity – Current Scenario	1	14.7.25		TLM2	
10.	Method to Fulfill the Basic Human Aspirations	1	15.7.25		TLM2	
11.	Practice Session **PS3** Exploring Natural Acceptance	1	16.7.25		TLM3	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Harmony in the Human Being

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	Understanding Human being as the Co-existence of the self and the body	1	18.7.25		TLM2	
13.	Distinguishing between the Needs of the self and the body	1	21.7.25		TLM2	
14.	Practice Session **PS4** Exploring the difference of Needs of self and body.	1	22.7.25		TLM3	
15.	The body as an Instrument of the self	1	23.7.25		TLM2	
16.	Understanding Harmony in the self	1	25.7.25		TLM2	
17.	Practice Session **PS5** Exploring Sources of Imagination in the self	1	28.7.25		TLM3	
18.	Harmony of the self with the body	1	29.7.25		TLM2	
19.	Programme to ensure self-regulation and Health	2	30.7.25 1.8.25		TLM2	
20.	Practice Session **PS6** Exploring Harmony of self with the body	2	4.8.25 5.8.25		TLM3	
21.	**Quiz**	1	6.8.25		TLM3	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT III: Harmony in the Family and Society

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Harmony in the Family – the Basic Unit of Human Interaction	2	8-8-2025 11-8-2025		TLM2	
23.	'Trust' – the Foundational Value in Relationship	1	12-8-2025		TLM2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Practice Session **PS7** Exploring the Feeling of Trust	1	13-8-2025		TLM3	
25.	'Respect' – as the Right Evaluation	1	18-8-2025		TLM2	
26.	Practice Session **PS8** Exploring the Feeling of Respect	1	19-8-2025		**TLM3**	
27.	Other Feelings, Justice in Human-to-Human Relationship	1	20-8-2025		TLM2	
28.	Understanding Harmony in the Society	1	22-8-2025		TLM2	
29.	Vision for the Universal Human Order	2	1-9-2025 2-9-2025		TLM2	
30.	Practice Session **PS9** Exploring Systems to fulfil Human Goal	1	3-9-2025		TLM3	
31.	**Quiz**	1	5-9-25		TLM3	
No. of classes required to complete UNIT-III:12				**No. of classes taken:**		

UNIT-IV: Harmony in the Nature/Existence

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Understanding Harmony in the Nature	2	8-9-2025 9-9-2025		TLM2	
33.	Interconnectedness, self-regulation and Mutual Fulfilment among the Four Orders of Nature	2	10-9-2025 12-9-2025		TLM2	
34.	Practice Session **PS10** Exploring the Four Orders of Nature	1	15-9-2025		TLM3	
35.	Realizing Existence as Co-existence at All Levels	1	16-9-2025		TLM2	
36.	The Holistic Perception of Harmony in Existence	2	17-9-2025 19-9-2025		TLM2	
37.	Practice Session **PS11** Exploring Co-existence in Existence.	2	22-9-2025 23-9-2025		TLM3	
39.	**Quiz**	1	24-9-2025		TLM3	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: Implications of the Holistic Understanding – a Look at Professional Ethics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Natural acceptance of human values	2	26-9-2025 29-9-2025		TLM2	
41.	Definitiveness of ethical human conduct	1	1-10-2025		TLM2	
42.	Practice Session **PS12** Exploring Ethical Human Conduct	1	3-10-2025		TLM3	
43.	A Basis for Humanistic Education, Humanistic Constitution and Universal Human	2	6-10-2025 7-10-2025		TLM2	
44.	Competence in professional ethics	2	8-10-2025 10-10-2025		TLM2	
45.	Practice Session **PS13** Exploring Humanistic Models in Education	1	13-10-2025		**TLM3**	
46.	Holistic Technologies, Production Systems and Management Models-Typical Case studies	2	14-10-2025 15-10-2025		TLM2	
47.	Strategies for Transition towards Value-based Life and Profession	1	17-10-2025		TLM2	
48.	Practice Session PS14 Exploring Steps of Transition	1	20-10-2025		TLM3	
	towards Universal Human Order					

51.	Quiz	1	22-10-2025		TLM3	
52.	**Revision**	6	24-10-2025 to 1-11-2025		TLM2	
No. of classes required to complete UNIT-V: 14				**No. of classes taken:**		

Teaching Learning Methods

TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/ MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C
EVALUATION PROCESS (R20 Regulation)

Evaluation Task	Marks
Assignment-I [Units-I, II & UNIT-III (Half of the Syllabus)]	A1=5
I-Descriptive Examination [Units-I, II & UNIT-III (Half of the Syllabus)]	D1=15
I-Short Answer Examination [Units-I, II & UNIT-III (Half of the Syllabus)]	SA1=10
Assignment-II [Unit-III (Remaining Half of the Syllabus), IV & V]	A2=5
II- Descriptive Examination [UNIT-III (Remaining Half of the Syllabus), IV & V]	D2=15
II- Short Answer Examination [UNIT-III (Remaining Half of the Syllabus), IV & V]	SA2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): D+SA+A	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D
PROGRAMME OUTCOMES (POs)

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess

	societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO 1	Specify, design, and analyze systems that efficiently generate, transmit and distribute electrical power.
PSO 2	Design and analyze electrical machines, modern drive and lighting systems.
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems.
PSO 4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Co-Ordinator	Module Coordinator	HoD
Name of the Faculty	Dr.P.Sobha Rani	Dr.M.Uma Vani	Dr.G.Nageswar Rao	Dr.P.Sobha Rani
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor : Dr.K.Harinadha Reddy
Course Name & Code : **Electro Magnetic Field Theory – 23EE03**
L-T-P Structure : **3-0-0**   **Credits:** 3
Program/Branch/Sem/Sec : B.Tech/EEE/III/A-sec   **A.Y.:** 2025-26

Pre-requisites: Concepts of Differential Equations, Vector Calculus and Electrical Circuit Analysis.

Course Educational Objective:
The objective of this course is to introduce general concepts of electric and magnetic fields. This course also covers Maxwell's equations in different forms and Maxwell's fourth equation for the induced EMF.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

PART-A	
CO1	Compute electric fields and potentials for various electric charge distributions**(Apply-L3)**
CO2	Analyse the behavior of conductors in electric fields, electric diploe and energy stored in dielectrics **(Apply-L3)**
CO3	Calculate the magnetic field intensity due to current carrying conductors **(Apply-L3)**
CO4	Estimate self and mutual inductances and the energy stored in the magnetic field.**(Apply-L3)**
CO5	Understand the concepts of Faraday's laws, Displacement current, Poynting theorem and Poynting vector **(Understand-L2)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2														
CO2	2	2											2	2		
CO3	3	2											1	2		
CO4	2	2												2		
CO5	2	2														

Textbooks:
1. "Elements of Electromagnetics" by Matthew N O Sadiku, Oxford Publications, 7th edition, 2018.
2. "Engineering Electromagnetics" by William H. Hayt& John. A. Buck Mc. Graw-Hill, 7th Editon.2006.

Reference Books:
1. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition.
2. "Electromagnetic Field Theory" by Yaduvir Singh, Pearson India, 1st edition, 2011.
3. "Fundamentals of Engineering Electromagnetics" by Sunil Bhooshan, Oxford University Press, 2012.
4. Schaum's Outline of Electromagneticsby Joseph A. Edminister, MahamoodNavi,4th Edition,2014.

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Electrostatics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction to Vector Algebra	1	30-06-2025		TLM1	
2	Coordinate systems	1	01-07-2025		TLM1	
3	Numericals on Coordinate systems	1	03-07-2025			
4	Coulomb's Law and Electric field Intensity (EFI)	1	03-07-2025		TLM1	
5	Numericals on Coulomb's Law and Electric field Intensity (EFI)- **Tutorial-1**	1	07-07-2025		TLM3	
6	EFI due to Continuous charge distributions (line and surface charge), Electric flux density	1	08-07-2025		TLM1	
7	Gauss's law (Maxwell's first equation, $\nabla \cdot \vec{D} = \rho_v$)	1	10-07-2025		TLM2	
8	Applications of Gauss's law	1	10-07-2025		TLM1	
9	Electric Potential,	1	14-07-2025		TLM1	
10	Work done in moving a point charge in an electrostatic field (second Maxwell's equation for static electric fields, $\nabla \times \vec{E} = 0$),	1	15-07-2025		TLM1	
11	Potential gradient, Laplace's and Poison's equations.	1	17-07-2025		TLM1	
12	Problems	1	17-07-2025		TLM1	
13	Problems **Tutorial-2**	1	21-07-2025		TLM3	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT – II: Conductors – Dielectrics and Capacitance

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Behaviour of conductor in Electric field	1	22-07-2025		TLM1	
2	Electric dipole and dipole moment	1	24-07-2025		TLM1	
3	Potential and EFI due to an electric dipole	1	24-07-2025		TLM1	
4	Torque on an Electric dipole placed in an electric field	1	28-07-2025		TLM2	
5	Current density-conduction and convection current densities Ohm's law in point form	1	29-07-2025		TLM1	
6	Behaviour of conductors in an electric field & Polarization	1	31-07-2025		TLM1	
7	**Tutorial-3**	1	31-07-2025		TLM3	
8	Dielectric constant and strength, Continuity equation 1and relaxation time	1	04-08-2025		TLM1	
9	Boundary conditions between conductor to dielectric, dielectric to dielectric and conductor to free space	1	05-08-2025		TLM1	
10	Capacitance of parallel plate, coaxial	1	07-08-2025		TLM1	

	and spherical capacitors					
11	**Tutorial-4**	1	07-08-2025		TLM3	
12	Energy stored and density in a static electric field	1	11-08-2025		TLM1	
13	Problems	1	12-08-2025		TLM1	
14	**Assignment-1**		14-08-2025		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT – III: Magneto statics, Ampere's Law and Force in magnetic fields

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Biot-Savart's law	1	14-08-2025		TLM1	
2	MFI due to Straight current carrying filament & circular current carrying wire	1	18-08-2025		TLM1	
3	MFI due to square, rectangle and solenoid current carrying wire	1	19-08-2025		TLM1	
4	Magnetic flux density and Maxwell's second Equation ($\nabla.\vec{B} = 0$)	1	21-08-2025		TLM1	
5	**Tutorial-5**	1	21-08-2025		TLM3	
6	Ampere's circuital law & Point form of Ampere's circuital law, Maxwell's third equation ($\nabla \times \vec{H} = \vec{J}$).	1	01-09-2025		TLM1	
7	MFI due to an infinite sheet & long filament	1	02-09-2025		TLM1	
8	MFI due to solenoid & toroidal current carrying conductor	1	04-09-2025		TLM1	
9	**Tutorial-6**	1	04-09-2025		TLM3	
10	Magnetic force, moving charges in a magnetic field – Lorentz force equation	1	08-09-2025		TLM1	
11	Force on a current element in a magnetic field & Force on a straight and a long current carrying conductor in a magnetic field	1	09-09-2025		TLM1	
12	Force between two straight long and parallel current carrying conductors	1	11-09-2025		TLM1	
13	Magnetic dipole, Magnetic torque, and moment.	1	11-09-2025		TLM1	
14	Problems	1	15-09-2025		TLM1	
15	Problems	1	16-09-2025		TLM1	
No. of classes required to complete UNIT-III: 15				No. of classes taken:		

UNIT – IV: Self and Mutual inductance

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Self and mutual inductance	1	18-09-2025		TLM1	
2	Determination of self-inductance of a solenoid	1	18-09-2025		TLM1	
3	Determination of self-inductance of a toroid & coaxial cable	1	22-09-2025		TLM2	
4	**Tutorial-7**	1	23-09-2025		TLM3	
5	Mutual inductance between a straight long wire and a square loop wire in the same plane	1	25-09-2025		TLM1	

6	Problems	1	25-09-2025		TLM1	
7	Energy stored and energy density in a magnetic field.	1	06-10-2025		TLM1	
8	**Tutorial-8**	1	07-10-2025		TLM3	
9	Problems	1	09-10-2025		TLM1	
10	Problems	1	09-10-2025		TLM1	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT – V: Time Varying Fields

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Faraday's laws of electromagnetic induction & Maxwell's fourth equation $\left(\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}\right)$	1	13-10-2025		TLM1	
2	Integral and point forms of Maxwell's equations	1	14-10-2025		TLM1	
3	Statically and dynamically induced EMF	1	16-10-2025		TLM1	
4	**Tutorial-9**	1	16-10-2025		TLM3	
5	Displacement current & Modification of Maxwell's equations for time varying fields	1	21-10-2025		TLM1	
6	Poynting theorem and Poynting vector	1	23-10-2025		TLM1	
7	**Tutorial-10**	1	23-10-2025		TLM3	
8	**Assignment-2**	1	27-10-2025		TLM3	
9	Problems	1	28-10-2025		TLM1	
10	Problems	1	30-10-2025		TLM1	
11	Content Beyond Syllabus	1	30-10-2025		TLM2	
No. of classes required to complete UNIT-V: 11				No. of classes taken:		

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Units-III, IV, V)	A2=5
II- Descriptive Examination (Units-III, IV, V)	M2=15
II-Quiz Examination (Units-III, IV, V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power.
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr.K.Harinadha Reddy**	**Dr.K.Harinadha Reddy**	**Dr.B.Pangedaiah**	**Dr.P.Sobha Rani**
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor : Dr.K.Harinadha Reddy
Course Name & Code   : Electro Magnetic Field Theory – 23EE03
L-T-P Structure   : 3-0-0   **Credits:** 3
Program/Branch/Sem/Sec : B.Tech/EEE/III/B-sec   **A.Y.:** 2025-26

Pre-requisites: Concepts of Differential Equations, Vector Calculus and Electrical Circuit Analysis.

Course Educational Objective:
The objective of this course is to introduce general concepts of electric and magnetic fields. This course also covers Maxwell's equations in different forms and Maxwell's fourth equation for the induced EMF.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

PART-A	
CO1	Compute electric fields and potentials for various electric charge distributions**(Apply-L3)**
CO2	Analyse the behavior of conductors in electric fields, electric diploe and energy stored in dielectrics **(Apply-L3)**
CO3	Calculate the magnetic field intensity due to current carrying conductors **(Apply-L3)**
CO4	Estimate self and mutual inductances and the energy stored in the magnetic field.**(Apply-L3)**
CO5	Understand the concepts of Faraday's laws, Displacement current, Poynting theorem and Poynting vector **(Understand-L2)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2														
CO2	2	2											2	2		
CO3	3	2											1	2		
CO4	2	2												2		
CO5	2	2														

Textbooks:
1. "Elements of Electromagnetics" by Matthew N O Sadiku, Oxford Publications, 7th edition, 2018.
2. "Engineering Electromagnetics" by William H. Hayt& John. A. Buck Mc. Graw-Hill, 7th Editon.2006.

Reference Books:
1. "Introduction to Electro Dynamics" by D J Griffiths, Prentice-Hall of India Pvt. Ltd, 2nd edition.
2. "Electromagnetic Field Theory" by Yaduvir Singh, Pearson India, 1st edition, 2011.
3. "Fundamentals of Engineering Electromagnetics" by Sunil Bhooshan, Oxford University Press, 2012.
4. Schaum's Outline of Electromagneticsby Joseph A. Edminister, MahamoodNavi,4th Edition,2014.

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Electrostatics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Introduction to Vector Algebra	1	30-06-2025		TLM1	
2	Coordinate systems	1	02-07-2025		TLM1	
3	Numericals on Coordinate systems	1	04-07-2025			
4	Coulomb's Law and Electric field Intensity (EFI)	1	05-07-2025		TLM1	
5	Numericals on Coulomb's Law and Electric field Intensity (EFI)- **Tutorial-1**	1	07-07-2025		TLM3	
6	EFI due to Continuous charge distributions (line and surface charge), Electric flux density	1	09-07-2025		TLM1	
7	Gauss's law (Maxwell's first equation, $\nabla \cdot \vec{D} = \rho_v$)	1	11-07-2025		TLM2	
8	Applications of Gauss's law	1	12-07-2025		TLM1	
9	Electric Potential,	1	14-07-2025		TLM1	
10	Work done in moving a point charge in an electrostatic field (second Maxwell's equation for static electric fields, $\nabla \times \vec{E} = 0$),	1	16-07-2025		TLM1	
11	Potential gradient, Laplace's and Poison's equations.	1	18-07-2025		TLM1	
12	Problems	1	19-07-2025		TLM1	
13	Problems **Tutorial-2**	1	21-07-2025		TLM3	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT – II: Conductors – Dielectrics and Capacitance

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Behaviour of conductor in Electric field	1	23-07-2025		TLM1	
2	Electric dipole and dipole moment	1	25-07-2025		TLM1	
3	Potential and EFI due to an electric dipole	1	26-07-2025		TLM1	
4	Torque on an Electric dipole placed in an electric field	1	28-07-2025		TLM2	
5	Current density-conduction and convection current densities Ohm's law in point form	1	30-07-2025		TLM1	
6	Behaviour of conductors in an electric field & Polarization	1	01-08-2025		TLM1	
7	**Tutorial-3**	1	02-08-2025		TLM3	
8	Dielectric constant and strength, Continuity equation 1and relaxation time	1	04-08-2025		TLM1	
9	Boundary conditions between conductor to dielectric, dielectric to dielectric and conductor to free space	1	06-08-2025		TLM1	
10	Capacitance of parallel plate, coaxial	1	08-08-2025		TLM1	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	and spherical capacitors					
11	**Tutorial-4**	1	09-08-2025		TLM3	
12	Energy stored and density in a static electric field	1	11-08-2025		TLM1	
13	Problems	1	13-08-2025		TLM1	
14	**Assignment-1**	1	16-08-2025		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT – III: Magneto statics, Ampere's Law and Force in magnetic fields

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Biot-Savart's law	1	18-08-2025		TLM1	
2	MFI due to Straight current carrying filament & circular current carrying wire	1	20-08-2025		TLM1	
3	MFI due to square, rectangle and solenoid current carrying wire	1	22-08-2025		TLM1	
4	Magnetic flux density and Maxwell's second Equation ($\nabla . \vec{B} = 0$)	1	23-08-2025		TLM1	
5	**Tutorial-5**	1	01-09-2025		TLM3	
6	Ampere's circuital law & Point form of Ampere's circuital law, Maxwell's third equation ($\nabla \times \vec{H} = \vec{J}$).	1	03-09-2025		TLM1	
7	MFI due to an infinite sheet & long filament	1	06-09-2025		TLM1	
8	MFI due to solenoid & toroidal current carrying conductor	1	08-09-2025		TLM1	
9	**Tutorial-6**	1	10-09-2025		TLM3	
10	Magnetic force, moving charges in a magnetic field – Lorentz force equation	1	12-09-2025		TLM1	
11	Force on a current element in a magnetic field & Force on a straight and a long current carrying conductor in a magnetic field	1	13-09-2025		TLM1	
12	Force between two straight long and parallel current carrying conductors	1	15-09-2025		TLM1	
13	Magnetic dipole, Magnetic torque, and moment.	1	17-09-2025		TLM1	
14	Problems	1	19-09-2025		TLM1	
15	Problems	1	20-09-2025		TLM1	
No. of classes required to complete UNIT-III: 15				No. of classes taken:		

UNIT – IV: Self and Mutual inductance

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Self and mutual inductance	1	22-09-2025		TLM1	
2	Determination of self-inductance of a solenoid	1	24-09-2025		TLM1	
3	Determination of self-inductance of a toroid & coaxial cable	1	26-09-2025		TLM2	
4	**Tutorial-7**	1	27-09-2025		TLM3	
5	Mutual inductance between a straight long wire and a square loop wire in the same plane	1	29-09-2025		TLM1	

6	Problems	1	04-10-2025		TLM1	
7	Energy stored and energy density in a magnetic field.	1	06-10-2025		TLM1	
8	**Tutorial-8**	1	08-10-2025		TLM3	
9	Problems	1	10-10-2025		TLM1	
10	Problems	1	11-10-2025		TLM1	

No. of classes required to complete UNIT-IV: 10   No. of classes taken:

UNIT – V: Time Varying Fields

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	Faraday's laws of electromagnetic induction & Maxwell's fourth equation $\left(\nabla \times \vec{E} = -\frac{\partial \vec{B}}{\partial t}\right)$	1	13-10-2025		TLM1	
2	Integral and point forms of Maxwell's equations	1	15-10-2025		TLM1	
3	Statically and dynamically induced EMF	1	17-10-2025		TLM1	
4	**Tutorial-9**	1	18-10-2025		TLM3	
5	Displacement current & Modification of Maxwell's equations for time varying fields	1	22-10-2025		TLM1	
6	Poynting theorem and Poynting vector	1	24-10-2025		TLM1	
7	**Tutorial-10**	1	25-10-2025		TLM3	
8	**Assignment-2**	1	27-10-2025		TLM3	
9	Problems	1	29-10-2025		TLM1	
10	Problems	1	31-10-2025		TLM1	
11	Content Beyond Syllabus	1	01-11-2025		TLM2	

No. of classes required to complete UNIT-V: 11   No. of classes taken:

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Units-III, IV, V)	A2=5
II- Descriptive Examination (Units-III, IV, V)	M2=15
II-Quiz Examination (Units-III, IV, V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

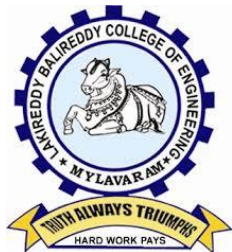|	
PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power.
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.K.Harinadha Reddy	Dr.K.Harinadha Reddy	Dr.B.Pangedaiah	Dr.P.Sobha Rani
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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DEPARTMENT OF ELECTRICAL &ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr.K.R.L.Prasad
Course Name & Code : Electrical Circuit Analysis-II &23EE04
L-T-P Structure : 3-0-0   **Credits:** 3
Program/Sem/Sec : B.Tech/III Sem/A   **A.Y.:** 2025-26

Pre-requisite: Analysis of DC and Single phase AC Circuits, Concepts of differentiation and integration.

Course Objectives: The objective of this course is to study the concepts of three phase circuits, transient analysis and Fourier analysis of electrical systems. This course also introduces the concept of filters.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Analyse the balanced and unbalanced 3 phase circuits for power calculations (Apply-L3)
CO2	Analyse the transient behavior of electrical networks in different domains (Apply-L3)
CO3	Estimate various Network parameters (Apply-L3)
CO4	Apply the concept of Fourier series to electrical systems (Apply-L3)
CO5	Design filters for electrical circuits (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2											3	2		
CO2	3	2										2	2	2		
CO3	3	2										1	2	2		
CO4	3	2											2			
CO5	3	2										2	2			3

Textbooks:
1. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8th Edition McGraw-Hill, 2013
2. Fundamentals of Electric Circuits, Charles K. Alexander, Mathew N. O. Sadiku, 3rd Edition, Tata McGraw-Hill, 2019

Reference Books:
1. Network Analysis, M. E. Van Valkenburg, 3rd Edition, PHI, 2019.
2. Network Theory, N. C. Jagan and C. Lakshminarayana, 1st Edition, B. S. Publications, 2012.
3. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyam Mohan S. Palli, 5th Edition, Tata McGraw-Hill, 2017.
4. Engineering Network Analysis and Filter Design (Including Synthesis of One Port Networks)- Durgesh C. Kulshreshtha Gopal G. Bhise, Prem R. Chadha ,Umesh Publications 2012.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, 7th Revised Edition.

Online Learning Resources:
1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105159/

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):
UNIT-I:THREE PHASE BALANCED AND UNBALANCED CIRCUITS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
1	Phase sequence, Star-Delta Connection	1	01-07-2025		TLM2	
2	V-I relations in balanced circuits	1	02-07-2025		TLM2	
3	Tutorial	1	03-07-2025		TLM3	
4	V-I relations in balanced circuits	1	05-07-2025		TLM2	
5	Three phase balanced circuits	1	08-07-2025		TLM1	
6	Three phase balanced circuits	1	09-07-2025		TLM1	
7	Tutorial	1	10-07-2025		TLM3	
8	Three phase balanced circuits	1	15-07-2025		TLM1	
9	Three phase balanced circuits	1	16-07-2025		TLM1	
10	Tutorial	1	17-07-2025		TLM3	
11	Three phase unbalanced circuits - Loop Method	1	19-07-2025		TLM1	
12	Three phase unbalanced circuits - Star Delta Transformation	1	22-07-2025		TLM1	
13	Measurement of power - two-wattmeter method	1	23-07-2025		TLM1	
14	Tutorial	1	24-07-2025		TLM3	
No. of classes required to complete UNIT-I:			**No. of classes taken:**			

UNIT-II:TRANSIENT ANALYSIS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
15	Initial conditions & Laplace transforms	1	26-07-2025		TLM1	
16	Transient response of RL(DC Excitation)	1	29-07-2025		TLM1	
17	Transient response of RL(Sinusoidal Excitation)	1	30-07-2025		TLM1	
18	Tutorial	1	31-07-2025		TLM3	
19	Transient response of RC(DC Excitation)	1	02-08-2025		TLM1	
20	Transient response of RC(Sinusoidal Excitation)	1	05-08-2025		TLM1	
21	Transient response of RLC(DC Excitation)	1	06-08-2025		TLM4	
22	Tutorial	1	07-08-2025		TLM3	
23	Transient response of RLC(DC Excitation)	1	12-08-2025		TLM1	
24	Transient response of RLC(Sinusoidal Excitation)	1	13-08-2025		TLM1	
25	Tutorial	1	14-08-2025		TLM3	
26	Transient response of RLC(Sinusoidal Excitation)	1	19-08-2025		TLM1	
27	Revision of Unit-I	1	20-08-2025		TLM2	
28	Tutorial	1	21-08-2025		TLM3	
29	Revision of Unit-I	1	23-08-2025		TLM2	
No. of classes required to complete UNIT-II:			**No. of classes taken:**			

UNIT-III:TWO PORT NETWORKS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
30	Two port network parameters	1	02-09-2025		TLM1	
31	Z parameters	1	03-09-2025		TLM4	
32	Tutorial	1	04-09-2025		TLM3	
33	Y parameters	1	06-09-2025		TLM1	
34	ABCD parameters	1	09-09-2025		TLM1	
35	Hybrid parameters	1	10-09-2025		TLM4	
36	Tutorial	1	11-09-2025		TLM3	
37	Relationship between parameters	1	16-09-2025		TLM1	
38	Interconnection of two port networks	1	17-09-2025		TLM1	
39	Tutorial	1	18-09-2025		TLM3	
40	Interconnection of two port networks	1	20-09-2025		TLM1	
No. of classes required to complete UNIT-III:			**No. of classes taken:**			

UNIT-IV:ANALYSIS OF ELECTRIC CIRCUITS WITH PERIODIC EXCITATION

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
41	Fourier series	1	23-09-2025		TLM1	
42	Trigonometric and complex FS	1	24-09-2025		TLM1	
43	Tutorial	1	25-09-2025		TLM3	
44	Application to Electrical Systems	1	27-09-2025		TLM1	
45	Application to Electrical Systems	1	07-10-2025		TLM1	
46	Effective value and average value	1	08-10-2025		TLM1	
47	Tutorial	1	09-10-2025		TLM3	
48	power factor	1	14-10-2025		TLM1	
49	Effect of harmonics	1	15-10-2025		TLM1	
50	Tutorial	1	16-10-2025		TLM3	
No. of classes required to complete UNIT-III:				**No. of classes taken:**		

UNIT-V: FILTERS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
51	Low pass Filter	1	18-10-2025		TLM2	
52	High pass Filter	1	21-10-2025		TLM2	
53	Band Elimination filters	1	22-10-2025		TLM2	
54	Tutorial	1	23-10-2025		TLM3	
55	Constant-k High pass filters	1	25-10-2025		TLM2	
56	Constant-k Low pass filters	1	28-10-2025		TLM2	
57	Design Problems	1	29-10-2025		TLM2	
58	Tutorial	1	30-10-2025		TLM3	

Content Beyond Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods
57		1	01-11-2025		TLM2

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

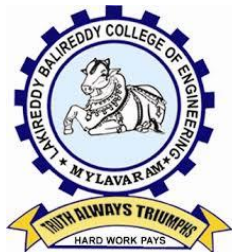| Evaluation Task	Marks
Assignment-I (Units-I & II)	A1=5
I-Descriptive Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Module Coordinator	Program Coordinator
Name of the Faculty	**Dr.K.R.L.Prasad**		
Signature			

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL &ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr.K.R.L.Prasad
Course Name & Code : Electrical Circuit Analysis-II &23EE04
L-T-P Structure : 3-0-0   **Credits:** 3
Program/Sem/Sec : B.Tech/III Sem/A   **A.Y.:** 2025-26

Pre-requisite: Analysis of DC and Single phase AC Circuits, Concepts of differentiation and integration.

Course Objectives: The objective of this course is to study the concepts of three phase circuits, transient analysis and Fourier analysis of electrical systems. This course also introduces the concept of filters.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Analyse the balanced and unbalanced 3 phase circuits for power calculations (Apply-L3)
CO2	Analyse the transient behavior of electrical networks in different domains (Apply-L3)
CO3	Estimate various Network parameters (Apply-L3)
CO4	Apply the concept of Fourier series to electrical systems (Apply-L3)
CO5	Design filters for electrical circuits (Apply-L3)

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2											3	2		
CO2	3	2										2	2	2		
CO3	3	2										1	2	2		
CO4	3	2											2			
CO5	3	2										2	2			3

Textbooks:
1. Engineering Circuit Analysis, William Hayt and Jack E. Kemmerly, 8th Edition McGraw-Hill, 2013
2. Fundamentals of Electric Circuits, Charles K. Alexander, Mathew N. O. Sadiku, 3rd Edition, Tata McGraw-Hill, 2019

Reference Books:
1. Network Analysis, M. E. Van Valkenburg, 3rd Edition, PHI, 2019.
2. Network Theory, N. C. Jagan and C. Lakshminarayana, 1st Edition, B. S. Publications, 2012.
3. Circuits and Networks Analysis and Synthesis, A. Sudhakar, Shyam Mohan S. Palli, 5th Edition, Tata McGraw-Hill, 2017.
4. Engineering Network Analysis and Filter Design (Including Synthesis of One Port Networks)- Durgesh C. Kulshreshtha Gopal G. Bhise, Prem R. Chadha ,Umesh Publications 2012.
5. Circuit Theory: Analysis and Synthesis, A. Chakrabarti, Dhanpat Rai & Co., 2018, 7th Revised Edition.

Online Learning Resources:
1. https://archive.nptel.ac.in/courses/117/106/117106108/
2. https://archive.nptel.ac.in/courses/108/105/108105159/

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):
UNIT-I:THREE PHASE BALANCED AND UNBALANCED CIRCUITS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
1	Phase sequence, Star-Delta Connection	1	01-07-2025		TLM2	
2	V-I relations in balanced circuits	1	02-07-2025		TLM2	
3	Tutorial	1	03-07-2025		TLM3	
4	V-I relations in balanced circuits	1	05-07-2025		TLM2	
5	Three phase balanced circuits	1	08-07-2025		TLM1	
6	Three phase balanced circuits	1	09-07-2025		TLM1	
7	Tutorial	1	10-07-2025		TLM3	
8	Three phase balanced circuits	1	15-07-2025		TLM1	
9	Three phase balanced circuits	1	16-07-2025		TLM1	
10	Tutorial	1	17-07-2025		TLM3	
11	Three phase unbalanced circuits - Loop Method	1	19-07-2025		TLM1	
12	Three phase unbalanced circuits - Star Delta Transformation	1	22-07-2025		TLM1	
13	Measurement of power - two-wattmeter method	1	23-07-2025		TLM1	
14	Tutorial	1	24-07-2025		TLM3	
No. of classes required to complete UNIT-I:				**No. of classes taken:**		

UNIT-II:TRANSIENT ANALYSIS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
15	Initial conditions & Laplace transforms	1	26-07-2025		TLM1	
16	Transient response of RL(DC Excitation)	1	29-07-2025		TLM1	
17	Transient response of RL(Sinusoidal Excitation)	1	30-07-2025		TLM1	
18	Tutorial	1	31-07-2025		TLM3	
19	Transient response of RC(DC Excitation)	1	02-08-2025		TLM1	
20	Transient response of RC(Sinusoidal Excitation)	1	05-08-2025		TLM1	
21	Transient response of RLC(DC Excitation)	1	06-08-2025		TLM4	
22	Tutorial	1	07-08-2025		TLM3	
23	Transient response of RLC(DC Excitation)	1	12-08-2025		TLM1	
24	Transient response of RLC(Sinusoidal Excitation)	1	13-08-2025		TLM1	
25	Tutorial	1	14-08-2025		TLM3	
26	Transient response of RLC(Sinusoidal Excitation)	1	19-08-2025		TLM1	
27	Revision of Unit-I	1	20-08-2025		TLM2	
28	Tutorial	1	21-08-2025		TLM3	
29	Revision of Unit-I	1	23-08-2025		TLM2	
No. of classes required to complete UNIT-II:				**No. of classes taken:**		

UNIT-III:TWO PORT NETWORKS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
30	Two port network parameters	1	02-09-2025		TLM1	
31	Z parameters	1	03-09-2025		TLM4	
32	Tutorial	1	04-09-2025		TLM3	
33	Y parameters	1	06-09-2025		TLM1	
34	ABCD parameters	1	09-09-2025		TLM1	
35	Hybrid parameters	1	10-09-2025		TLM4	
36	Tutorial	1	11-09-2025		TLM3	
37	Relationship between parameters	1	16-09-2025		TLM1	
38	Interconnection of two port networks	1	17-09-2025		TLM1	
39	Tutorial	1	18-09-2025		TLM3	
40	Interconnection of two port networks	1	20-09-2025		TLM1	
No. of classes required to complete UNIT-III:				**No. of classes taken:**		

UNIT-IV:ANALYSIS OF ELECTRIC CIRCUITS WITH PERIODIC EXCITATION

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
41	Fourier series	1	23-09-2025		TLM1	
42	Trigonometric and complex FS	1	24-09-2025		TLM1	
43	Tutorial	1	25-09-2025		TLM3	
44	Application to Electrical Systems	1	27-09-2025		TLM1	
45	Application to Electrical Systems	1	07-10-2025		TLM1	
46	Effective value and average value	1	08-10-2025		TLM1	
47	Tutorial	1	09-10-2025		TLM3	
48	power factor	1	14-10-2025		TLM1	
49	Effect of harmonics	1	15-10-2025		TLM1	
50	Tutorial	1	16-10-2025		TLM3	
No. of classes required to complete UNIT-III:				No. of classes taken:		

UNIT-V: FILTERS

S.No	Topics to be Covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
51	Low pass Filter	1	18-10-2025		TLM2	
52	High pass Filter	1	21-10-2025		TLM2	
53	Band Elimination filters	1	22-10-2025		TLM2	
54	Tutorial	1	23-10-2025		TLM3	
55	Constant-k High pass filters	1	25-10-2025		TLM2	
56	Constant-k Low pass filters	1	28-10-2025		TLM2	
57	Design Problems	1	29-10-2025		TLM2	
58	Tutorial	1	30-10-2025		TLM3	

Content Beyond Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods
57		1	01-11-2025		TLM2

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I & II)	A1=5
I-Descriptive Examination (Units-I & II)	M1=15
I-Quiz Examination (Units-I & II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (Unit-III, IV & V)	M2=15
II-Quiz Examination (Unit-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Module Coordinator	Program Coordinator
Name of the Faculty	**Dr.K.R.L.Prasad**		
Signature			

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: DR J.SIVAVARA PRASAD
Course Name & Code : DC MACHINES & TRANSFORMERS –23EE05
L-T-P Structure : 3-0-0   **Credits:** 3
Program/Sem/Sec : B.Tech/III/A   **A.Y.:** 2025-26

PREREQUISITE: Electric and magnetic fields

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to learn the principle, construction and performance characteristics of DC Machines and Transformers, methods of speed control of a DC motor and different connections of poly-phase transformers.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the concepts of construction, operation and performance of dc generators. **(Understand-L2)**
CO2	Analyze the operation and performance of dc motors. **(Understand-L2)**
CO3	Evaluate the performance of 1- phase transformers. **(Apply-L3)**
CO4	Analyse various configurations of three phase transformers. **(Understand-L2)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2											2			
CO2	2	2	2											2		
CO3	2	2	2									1	2			
CO4	2	2	2									2	2			
	1 - Low					**2 –**Medium					**3 -** High					

TEXTBOOKS:

T1	Electrical Machinery by Dr. P S Bimbhra, 7th edition, Khanna Publishers, New Delhi,1995.
T2	Performance and analysis of AC machines by M.G. Say, CBS, 2002.

REFERENCE BOOKS:

R1	Electrical Machines by D. P.Kothari, I .J .Nagarth, McGraw Hill Publications, 5th edition
R2	Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2011.
R3	Generalized Theory of Electrical Machines by Dr. P S Bimbhra, 7th Edition, Khanna Publishers, 2021.
R4	Theory & Performance of Electrical Machines by J.B.Gupta, S.K.Kataria& Sons,2007.
R5	Electric Machinery by Fitzgerald, A.E.,Kingsley, Jr.,C.,& Umans, S. D, 7th edition, McGraw-Hill Education, 2014.

Online Learning Resources:

1.   nptel.ac.in/courses/108/105/108105112
2.   nptel.ac.in/courses/108/105/108105155

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: D.C. Machines

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Construction of D.C. Generators	2	01-07-2025 02-07-2025		TLM1	
2.	Principle of Operation of D.C. Generators	1	03-07-2025		TLM1	
3.	E.M.F Equation D.C. Generator	1	04-07-2025		TLM1	
4.	Excitation techniques	1	08-07-2025		TLM1	
5.	characteristics of DC generators	1	09-07-2025		TLM1	
6.	Tutorial-1	1	10-07-2025		TLM3	
7.	applications of DC Generators	1	11-07-2025		TLM1	
8.	Back-emf and torque equations of DC motor	1	15-07-2025		TLM1	
9.	Commutation	1	16-07-2025		TLM1	
10.	Tutorial-2	1	17-07-2025		TLM3	
11.	Armature reaction in D.C. Generator	2	18-07-2025 22-07-2025		TLM1	
12.	problems	2	23-07-2025 24-07-2025		TLM1	
13.	Repetition	1	25-07-2025		TLM2	
No. of classes required to complete UNIT-I: 16				**No. of classes taken:**		

UNIT-II: Starting, Speed Control and Testing of DC Machines

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14.	Characteristics of DC motors	1	29-07-2025		TLM1	
15.	losses and efficiency	1	30-07-2025		TLM1	
16.	Tutorial-3	1	31-07-2025		TLM3	
17.	applications of DC motors	1	01-08-2025		TLM1	
18.	Necessity of a starter – starting by 3-point and 4-point starters	2	05-08-2025 06-08-2025		TLM1	
19.	Tutorial-4	1	07-08-2025		TLM3	
20.	speed control by armature voltage and field current control	1	08-08-2025		TLM1	
21.	testing of DC machines – brake test	1	12-08-2025		TLM1	
22.	Swinburne's test	1	13-08-2025		TLM1	
23.	Hopkinson's test–Field Test	1	14-08-2025		TLM1	
24.	problems	2	19-08-2025 20-08-2025		TLM1	
25.	Tutorial-5	1	21-08-2025		TLM3	
26.	Repetition	1	22-08-2025		TLM2	
No. of classes required to complete UNIT-II: 15				**No. of classes taken:**		

UNIT-III: Single-phase Transformers

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	Introduction to single-phase Transformers (Construction and principle of operation)	1	02-09-2025		TLM1	
28.	emf equation	1	03-09-2025		TLM1	
29.	Tutorial-6	1	04-09-2025		TLM3	
30.	operation on no-load and on load	1	09-09-2025		TLM1	
31.	lagging, leading and unity power factors loads	1	10-09-2025		TLM1	
32.	Tutorial-7	1	11-09-2025		TLM3	
33.	phasor diagrams– equivalent circuit	1	12-09-2025		TLM1	
34.	regulation – losses and efficiency	1	16-09-2025		TLM1	
35.	effect of variation of frequency and supply voltage on losses	1	17-09-2025		TLM1	
36.	Tutorial-8	1	18-09-2025		TLM3	
37.	all day efficiency	1	19-09-2025		TLM1	
38.	Problems	1	23-09-2025		TLM1	

No. of classes required to complete UNIT-III: 12 **No. of classes taken:**

UNIT-IV: Testing of Transformers

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
39.	Open Circuit and Short Circuit tests	1	24-09-2025		TLM1	
40.	Tutorial-9	1	25-09-2025		TLM3	
41.	Sumpner's test	1	26-09-2025		TLM1	
42.	separation of losses	1	30-09-2025		TLM1	
43.	Parallel operation with equal and unequal voltage ratios	1	07-10-2025		TLM1	
44.	auto transformer – equivalent circuit	1	08-10-2025		TLM1	
45.	Tutorial-10	1	09-10-2025		TLM3	
46.	comparison with two winding transformers	1	10-10-2025		TLM1	
47.	problems	1	14-10-2025		TLM1	
48.	Tutorial-11	1	15-10-2025		TLM3	

No. of classes required to complete UNIT-IV: 10 **No. of classes taken:**

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	Polyphase connections- Y/Y, Y/Δ, Δ/Y, Δ/Δ	1	16-10-2025		**TLM1**	
49.	open Δ and Vector groups	1	17-10-2025		TLM1	
50.	third harmonics in phase voltages	1	21-10-2025		TLM1	
51.	Parallel operation	1	22-10-2025		TLM1	
52.	Tutorial-12	1	23-10-2025		TLM3	
53.	three winding transformers	1	24-10-2025		TLM1	
54.	transients in switching	1	28-10-2025		TLM1	

55.	off load and on load tap changers	1	29-10-2025		TLM1	
56.	Scott connection	1	30-10-2025		TLM1	
57.	**Content Beyond Syllabus**	**1**	**31-10-2025**		**TLM2**	

| **No. of classes required to complete UNIT-V: 10** | | | **No. of classes taken:** | |

Teaching Learning Methods				
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)	
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)	
TLM3	Tutorial	**TLM6**	Group Discussion/Project	

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, III)	Q1=10
Assignment-II (Unit-III ,IV & V)	A2=5
II- Descriptive Examination (Unit-III ,IV & V)	M2=15
II-Quiz Examination (Unit-III ,IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D
PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO 4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr J.Sivavara Prasad	Dr J.Sivavara Prasad	Dr J.Sivavara Prasad	Dr.P.Sobha Rani
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: DR J. SIVAVARA PRASAD
Course Name & Code : DC MACHINES & TRANSFORMERS –23EE05
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech/III/B **A.Y.:** 2025-26

PREREQUISITE: Electric and magnetic fields

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course enables the student to learn the principle, construction and performance characteristics of DC Machines and Transformers, methods of speed control of a DC motor and different connections of poly-phase transformers.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the concepts of construction, operation and performance of dc generators. **(Understand-L2)**
CO2	Analyze the operation and performance of dc motors. **(Understand-L2)**
CO3	Evaluate the performance of 1- phase transformers. **(Apply-L3)**
CO4	Analyse various configurations of three phase transformers.**(Understand-L2)**

COURSE ARTICULATION MATRIX (Correlation between COs, POs & PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2											2			
CO2	2	2	2											2		
CO3	2	2	2									1	2			
CO4	2	2	2									2	2			
	1 - Low				**2 –**Medium					**3 -** High						

TEXTBOOKS:

T1	Electrical Machinery by Dr. P S Bimbhra, 7th edition, Khanna Publishers, New Delhi,1995.
T2	Performance and analysis of AC machines by M.G. Say, CBS, 2002.

REFERENCE BOOKS:

R1	Electrical Machines by D. P.Kothari, I .J .Nagarth, McGraw Hill Publications, 5th edition
R2	Electrical Machinery Fundamentals by Stephen J Chapman McGraw Hill education 2011.
R3	Generalized Theory of Electrical Machines by Dr. P S Bimbhra, 7th Edition, Khanna Publishers, 2021.
R4	Theory & Performance of Electrical Machines by J.B.Gupta, S.K.Kataria& Sons,2007.
R5	Electric Machinery by Fitzgerald, A.E.,Kingsley, Jr.,C.,& Umans, S. D, 7th edition, McGraw-Hill Education, 2014.

Online Learning Resources:

1. nptel.ac.in/courses/108/105/108105112
2. nptel.ac.in/courses/108/105/108105155

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: D.C. Machines

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Construction of D.C. Generators	1	30-06-2025		TLM1	
2.	Principle of Operation of D.C. Generators	1	02-07-2025		TLM1	
3.	E.M.F Equation D.C. Generator	1	03-07-2025		TLM1	
4.	Excitation techniques	1	05-07-2025		TLM1	
5.	characteristics of DC generators	1	07-07-2025		TLM1	
6.	Tutorial-1	1	09-07-2025		TLM3	
7.	applications of DC Generators	1	10-07-2025		TLM1	
8.	Back-emf and torque equations of DC motor	1	14-07-2025		TLM1	
9.	Tutorial-2	1	16-07-2025		TLM3	
10.	Commutation	1	17-07-2025		TLM1	
11.	Armature reaction in D.C. Generator	1	19-07-2025		TLM1	
12.	problems	1	21-07-2025		TLM1	
13.	Tutorial-3	1	23-07-2025		TLM3	
14.	problems	1	24-07-2025		TLM1	
15.	Repetition	1	26-07-2025		TLM2	

No. of classes required to complete UNIT-I: 15 | | | **No. of classes taken:** | | |

UNIT-II: Starting, Speed Control and Testing of DC Machines

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	Characteristics of DC motors	1	28-07-2025		TLM1	
17.	Tutorial-4	1	30-07-2025		TLM3	
18.	losses and efficiency	1	31-07-2025		TLM1	
19.	applications of DC motors	1	02-08-2025		TLM1	
20.	Necessity of a starter – starting by 3-point and 4-point starters	2	04-08-2025 07-08-2025		TLM1	
21.	Tutorial-5	1	06-08-2025		TLM3	
22.	speed control by armature voltage and field current control	1	11-08-2025		TLM1	
23.	Tutorial-6	1	13-08-2025		TLM3	
24.	testing of DC machines – brake test	1	14-08-2025		TLM1	
25.	Swinburne's test	1	18-08-2025		TLM1	
26.	Hopkinson's test–Field Test, problems	2	20-08-2025 21-08-2025		TLM1	
27.	problems	1	23-08-2025		TLM1	

No. of classes required to complete UNIT-II: 14 | | | **No. of classes taken:** | | |

UNIT-III: Single-phase Transformers

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Introduction to single-phase Transformers (Construction and principle of operation)	1	01-09-2025		TLM1	
29.	Tutorial-7	1	03-09-2025		TLM3	
30.	emf equation	1	04-09-2025		TLM1	
31.	operation on no-load and on load	1	06-09-2025		TLM1	
32.	lagging, leading and unity power factors loads	1	08-09-2025		TLM1	
33.	Tutorial-8	1	10-09-2025		TLM3	
34.	phasor diagrams– equivalent circuit	1	11-09-2025		TLM1	
35.	regulation – losses and efficiency	1	15-09-2025		TLM1	
36.	Tutorial-9	1	17-09-2025		TLM3	
37.	effect of variation of frequency and supply voltage on losses	1	18-09-2025		TLM1	
38.	all day efficiency.	1	20-09-2025		TLM1	

No. of classes required to complete UNIT-III: 11 | **No. of classes taken:**

UNIT-IV: Testing of Transformers

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
39.	Open Circuit and Short Circuit tests	1	22-09-2025		TLM1	
40.	Tutorial-10	1	24-09-2025		TLM3	
41.	Sumpner's test	1	25-09-2025		TLM2	
42.	separation of losses	1	27-09-2025		TLM1	
43.	Parallel operation with equal and unequal voltage ratios	1	29-09-2025		TLM1	
44.	auto transformer – equivalent circuit	1	06-10-2025		TLM1	
45.	Tutorial-11	1	08-10-2025		TLM3	
46.	comparison with two winding transformers	1	09-10-2025		TLM1	
47.	problems	1	11-10-2025		TLM1	
48.	Tutorial-12	1	15-10-2025		TLM3	

No. of classes required to complete UNIT-IV: 10 | **No. of classes taken:**

UNIT-V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	Polyphase connections- Y/Y, Y/Δ, Δ/Y, Δ/Δ	1	13-10-2025		TLM1	
49.	open Δ and Vector groups	1	16-10-2025		TLM1	
50.	third harmonics in phase voltages	1	18-10-2025		TLM1	
51.	Tutorial-13	1	22-10-2025		TLM3	
52.	Parallel operation	1	23-10-2025		TLM1	
53.	three winding transformers	1	24-10-2025		TLM1	
54.	transients in switching	1	27-10-2025		TLM1	
55.	off load and on load tap changers	1	29-10-2025		TLM1	

56.	Scott connection	1	30-10-2025		TLM1	
57.	**Content Beyond Syllabus**	**1**	01-11-2025		**TLM2**	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

Teaching Learning Methods				
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)	
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)	
TLM3	Tutorial	**TLM6**	Group Discussion/Project	

PART-C

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, III)	Q1=10
Assignment-II (Unit-III ,IV & V)	A2=5
II- Descriptive Examination (Unit-III ,IV & V)	M2=15
II-Quiz Examination (Unit-III ,IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

EVALUATION PROCESS (R23 Regulation):

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO 4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr J.Sivavara Prasad	Dr J.Sivavara Prasad	Dr J.Sivavara Prasad	Dr.P.Sobha Rani
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM   : II B. Tech., III-Sem., EEE-A
ACADEMIC YEAR   : 2025-26
COURSE NAME & CODE : **Environmental Science**
L-T-P STRUCTURE   : 2-0-0
COURSE CREDITS   : 0
COURSE INSTRUCTOR : Dr. V. Bhagya Lakshmi
COURSE COORDINATOR : Dr. Shaheda Niloufer
PRE-REQUISITES   : biology, chemistry, geology, mathematics or physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
 1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:
 T1. Erach Bharucha, Text book of Environmental Studies for Undergraduate Courses, Universities Press (India) Private Limited, 2019.
 T2. Palaniswamy, EnvironmentalStudies, 2/e, Pearsoneducation, 2014.
 T3. S.AzeemUnnisa, EnvironmentalStudies, AcademicPublishingCompany, 2021.

T4.K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1.KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3.M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4.J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5.J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6.G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B
COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	01-07-2025		TLM2			
2.	Multidisciplinary Nature of Environmental Studies	1	05-07-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	08-07-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	15-07-2025		TLM1	CO1	T1,T2	
5.	Mineral resources & Food resources	1	19-07-2025		TLM1	CO1	T1,T2	
6.	Energy resources	1	22-07-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		06				No. of classes taken:		

UNIT-II: Ecosystems and Biodiversity

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
7.	Ecosystems – Structure & Functions	1	29-07-2025		TLM1	CO2	T1,T2	
8.	Ecological succession & Food chains, Food webs & Ecological Pyramids	1	02-08-2025		TLM1	CO2	T1,T2	
9.	Biodiversity – introduction, levels, bio geographic classification	1	05-08-2025		TLM1	CO2	T1,T2	
10	Values of Biodiversity, India as mega diversity nation	1	12-08-2025		TLM1	CO2	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
11	Threats to biodiversity and Conservation of biodiversity	1	19-08-2025		TLM1	CO2	T1,T2	
12	Revision	1	23-08-2025		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (25-08-2025 TO 30-08-2025)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
13.	Environmental pollution -Air pollution	1	02-09-2025		TLM1	CO3	T1,T2	
14.	Water pollution, Marine pollution, Thermal pollution	1	06-09-2025		TLM1	CO3	T1,T2	
15.	Soil pollution	1	09-09-2025		TLM1	CO3	T1,T2	
16.	Noise pollution & Nuclear Hazards	1	16-09-2025		TLM1	CO3	T1,T2	
17.	Solid waste management	1	20-09-2025		TLM1	CO3	T1,T2	
18.	Disaster management	1	23-09-2025		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19	From Unsustainable to Sustainable development	1	27-09-2025		TLM1	CO4	T1,T2	
20	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	29-09-2025		TLM1	CO4	T1,T2	
21	Environmental ethics, Climate change	1	04-10-2025		TLM1	CO4	T1,T2	
22	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	07-10-2025		TLM1	CO4	T1,T2	
23	Environmental Acts	1	14-10-2025		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		05			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book	HOD Sign

		Required	Completion	Completion	Methods	COs	followed	Weekly
24	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	25-10-2025		TLM1	CO5	T1,T2	
25	Environment and human health –Human Rights – Value Education	1	28-10-2025		TLM1	CO5	T1,T2	
26	HIV/AIDS – Women and Child Welfare	1	28-10-2025		TLM1	CO5	T1,T2	
27	Role of information Technology in Environment and human health	1	01-11-2025		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		03			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
28.	Case studies	2	11-08-2025 07-10-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (03-11-2025 TO 08-11-2025)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for

	the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. V. Bhagya Lakshmi	**Dr. ShahedaNiloufer**	**Dr. ShahedaNiloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM	**:** II B. Tech., III-Sem., EEE-B
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**: Environmental Science**
L-T-P STRUCTURE	**:** 2-0-0
COURSE CREDITS	**:** 0
COURSE INSTRUCTOR	**:** Dr. V. Bhagya Lakshmi
COURSE COORDINATOR	**:** Dr. Shaheda Niloufer
PRE-REQUISITES	**:** Biology, Chemistry, Geology, Mathematics or Physics

Course Objectives:

1	To enlighten the learners in the concept of differential equations and multivariable calculus
2	To furnish the learners with basic concepts and techniques at intermediate level to lead them into advanced level by handling various real-world applications.

Course Outcomes (COs): At the end of the course, students will be able to

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

COURSE ARTICULATION MATRIX (Correlation between Cos &POs, PSOs):

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
    1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:
    T1. Erach Bharucha, Text book of Environmental Studies for Undergraduate Courses, Universities Press (India) Private Limited, 2019.
    T2. Palaniswamy, EnvironmentalStudies, 2/e, Pearsoneducation, 2014.
    T3. S.AzeemUnnisa, EnvironmentalStudies, AcademicPublishingCompany, 2021.

T4. K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate
Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1. KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.
R3. M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.
R4. J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.
R5. J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.
R6. G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.
R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

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Part-B
COURSE DELIVERY PLAN (LESSON PLAN):

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S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	30-06-2025		TLM2			
2.	Multidisciplinary Nature ofEnvironmental Studies	1	02-07-2025		TLM2			

<div align="center">

UNIT-I: Multidisciplinary Nature of Environmental Studies

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S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Natural Resources – Forest resources	1	07-07-2025		TLM1	CO1	T1,T2	
4.	Water resources	1	09-07-2025		TLM1	CO1	T1,T2	
5.	Mineral resources	1	14-07-2025		TLM1	CO1	T1,T2	
6.	Food resources	1	16-07-2025		TLM1	CO1	T1,T2	
7.	Energy resources	1	21-07-2025		TLM1	CO1	T1,T2	
8.	Energy resources	1	23-07-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I	08				No. of classes taken:			

<div align="center">

UNIT-II: Ecosystems and Biodiversity

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S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
9.	Ecosystems – Structure & Functions	1	28-07-2025		TLM1	CO2	T1,T2	
10.	Ecological succession &	1	30-07-2025		TLM1	CO2	T1,T2	
11.	Food chains, Food webs & Ecological Pyramids	1	04-08-2025		TLM1	CO2	T1,T2	
12.	Types of ecosystems	1	06-08-2025		TLM1	CO2	T1,T2	
13.	Biodiversity – introduction, levels, bio geographic classification	1	11-08-2025		TLM1	CO2	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Values of Biodiversity, India as mega diversity nation	1	13-08-2025		TLM1	CO2	T1,T2	
15.	Threats to biodiversity and Conservation of biodiversity	1	18-08-2025		TLM1	CO2	T1,T2	
16.	Revision	1	20-08-2025		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		08			No. of classes taken:			

I MID EXAMINATIONS (25-08-2025 TO 30-08-2025)

UNIT-III: Environmental Pollution

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Environmental pollution -Air pollution	1	01-09-2025		TLM1	CO3	T1,T2	
18.	Water pollution, Marine pollution, Thermal pollution	1	03-09-2025		TLM1	CO3	T1,T2	
19.	Soil pollution	1	08-09-2025		TLM1	CO3	T1,T2	
20.	Noise pollution & Nuclear Hazards	1	10-09-2025		TLM1	CO3	T1,T2	
21.	Solid waste management	1	15-09-2025		TLM1	CO3	T1,T2	
22.	Disaster management	1	17-09-2025		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
23.	From Unsustainable to Sustainable development	1	22-09-2025		TLM1	CO4	T1,T2	
24.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	24-09-2025		TLM1	CO4	T1,T2	
25.	Environmental ethics, Climate change	1	29-09-2025		TLM1	CO4	T1,T2	
26.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	01-10-2025		TLM1	CO4	T1,T2	
27.	Environmental Acts	1	06-10-2025		TLM1	CO4	T1,T2	
28.	Environmental Acts	1	08-10-2025		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
29.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	13-10-2025		TLM1	CO5	T1,T2	
30.	Environment and human health –Human Rights – Value Education	1	15-10-2025		TLM1	CO5	T1,T2	
31.	HIV/AIDS – Women and Child Welfare	1	20-10-2025		TLM1	CO5	T1,T2	
32.	Role of information Technology in Environment and human health	1	22-10-2025		TLM1	CO5	T1,T2	
33.	Revision	1	27-10-2025		TLM3	CO5	T1,T2	
34.	Revision	1	29-10-2025		TLM3	CO5	T1,T2	
No. of classes required to complete UNIT-V		06			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
35.	Case studies	2	18-08-2025 13-10-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			

II MID EXAMINATIONS (03-11-2025 TO 08-11-2025)

Teaching Learning Methods

TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals

	and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety and the cultural, societal and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. V. Bhagya Lakshmi	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. J.V.Pavan Chand / Mr.P.Ratnakar
Course Name & Code : ELECTRICAL CIRCUIT ANALYSIS-II AND SIMULATION LAB & 23EE53
L-T-P Structure : 0-0-3 **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/EEE/III/A **A.Y.:** 2025-26

Course Educational Objective: To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the power calculations in three phase circuits.
CO2	Evaluate the time response of given network.
CO3	Evaluate two port network parameters.
CO4	Simulate and analyse electrical circuits using suitable software.

CO-PO Articulation matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2						2	2	2		1	3	2		
CO2	3	2						2	2	2		1	2	2		
CO3	3	2						2	2	2		1	2			
CO4	3	2			3			2	2	2		1	2			2

LIST OF EXPERIMENTS

1. Measurement of Active Power and Reactive Power for balanced loads.
2. Measurement of Active Power and Reactive Power for unbalanced loads.
3. Determination of Z and Y parameters.
4. Determination of ABCD and hybrid parameters
5. Verification of Kirchhoff's current and voltage law using simulation tools.
6. Verification of mesh and nodal analysis using simulation tools.
7. Verification of super position and maximum power transfer theorems using simulation tools.
8. Verification of Reciprocity and Compensation theorems using simulation tools.
9. Verification of Thevenin's and Norton's theorems using simulation tools.
10. Verification of series and parallel resonance using simulation tools.
11. Simulation and analysis of transient response of RL, RC and RLC circuits.
12. Verification of self inductance and mutual inductance by using simulation tools.

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):

SECTION-A SCHEDULE

DAY : Monday
Batches : 23761A0204, 24761A0201-24761A0231

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
		Tentative date 30/06	07/07	14/07	21/07	28/07	04/08	11/08	25/08	01/09	08/09	15/09	22/09	06/10	13/10	27/10
	Actual date															
B-1	24761A0201 24761A0202 24761A0203	Demo	1	2	3	4	5	6	7	8	9	10				
B-2	24761A0204 24761A0205 24761A0206	Demo	2	3	4	5	6	7	8	9	10	1				
B-3	24761A0207 24761A0208 24761A0209	Demo	3	4	5	6	7	8	9	10	1	2				
B-4	24761A0210 24761A0211 24761A0212	Demo	4	5	6	7	8	9	10	1	2	3	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM
B-5	24761A0213 24761A0214 24761A0215	Demo	5	6	7	8	9	10	1	2	3	4				
B-6	24761A0216 24761A0217 24761A0218	Demo	6	7	8	9	10	1	2	3	4	5				
B-7	24761A0219 24761A0220 24761A0221	Demo	7	8	9	10	1	2	3	4	5	6				
B-8	24761A0223 24761A0224 24761A0225	Demo	8	9	10	1	2	3	4	5	6	7				
B-9	24761A0226 24761A0227 24761A0228	Demo	9	10	1	2	3	4	5	6	7	8				
B-10	24761A0229 24761A0230 24761A0231	Demo	10	1	2	3	4	5	6	7	8	9				

DAY : WEDNESDAY
Batches : 24761A0232-24761A0263

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week	XVI Week
		Tentative date 02/07	09/07	16/07	23/07	30/08	06/08	13/08	20/08	03/09	10/09	17/09	24/09	01/10	08/10	15/10	29/10
	Actual date																
B-1	24761A0232 24761A0234 24761A0235	Demo	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIME	REVISION OF EXPERIME
B-2	24761A0236 24761A0237 24761A0238	Demo	2	3	4	5	6	7	8	9	10	1					
B-3	24761A0239 24761A0240 24761A0242	Demo	3	4	5	6	7	8	9	10	1	2					

B-4	24761A0243 24761A0244 24761A0245	Demo	4	5	6	7	8	9	10	1	2	3					
B-5	24761A0246 24761A0247 24761A0248	Demo	5	6	7	8	9	10	1	2	3	4					
B-6	24761A0249 24761A0250 24761A0251	Demo	6	7	8	9	10	1	2	3	4	5					
B-7	24761A0252 24761A0253 24761A0254	Demo	7	8	9	10	1	2	3	4	5	6					
B-8	24761A0255 24761A0256 24761A0257	Demo	8	9	10	1	2	3	4	5	6	7					
B-9	24761A0258 24761A0259 24761A0260	Demo	9	10	1	2	3	4	5	6	7	8					
B-10	24761A0261 24761A0262 24761A0263	Demo	10	1	2	3	4	5	6	7	8	9					

PART-C

EVALUATION PROCESS (R23 Regulations):

Evaluation Task	Marks
Day – Day Evaluation	A=10
Record	B=05
Internal Exam	C=15
Cumulative Internal Examination (CIE) : A+B+C	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
PEO2	Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.
PEO3	Work effectively as individuals and as team members in multidisciplinary projects.
PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in

	societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr J V PAVAN CHAND Mr.P.Ratnakar	Mr J V PAVAN CHAND	Dr. B PANGEDAIAH	Dr.P SOBHA RANI
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Mr. A.V. Ravikumar / Mrs. G.Tabita
Course Name & Code : ELECTRICAL CIRCUIT ANALYSIS-II AND SIMULATION LAB
& 23EE53
L-T-P Structure : 0-0-3   **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/EEE/III/B   **A.Y.:** 2025-26

Course Educational Objective: To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the power calculations in three phase circuits.
CO2	Evaluate the time response of given network.
CO3	Evaluate two port network parameters.
CO4	Simulate and analyse electrical circuits using suitable software.

CO-PO Articulation matrix

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2						2	2	2		1	3	2		
CO2	3	2						2	2	2		1	2	2		
CO3	3	2						2	2	2		1	2			
CO4	3	2			3			2	2	2		1	2			2

LIST OF EXPERIMENTS
1. Measurement of Active Power and Reactive Power for balanced loads.
2. Measurement of Active Power and Reactive Power for unbalanced loads.
3. Determination of Z and Y parameters.
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8. Verification of Reciprocity and Compensation theorems using simulation tools.
9. Verification of Thevenin's and Norton's theorems using simulation tools.
10. Verification of series and parallel resonance using simulation tools.
11. Simulation and analysis of transient response of RL, RC and RLC circuits.
12. Verification of self inductance and mutual inductance by using simulation tools.

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):

SECTION-A SCHEDULE

DAY : TUESDAY

Batches : 23761A02A2, 2A6, 24761A0264 - 295

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week	XVI Week
	Tentative date	01/07	08/07	15/07	22/07	29/07	05/08	12/08	19/08	02/09	09/09	16/09	23/09	07/10	14/10	21/10	28/10
	Actual date																
B-1	23761A02A2 23761A02A6 24761A0264	Demo	1	2	3	4	5	6	7	8	9	10					
B-2	24761A0266 24761A0267 24761A0268	Demo	2	3	4	5	6	7	8	9	10	1					
B-3	24761A0269 24761A0270 24761A0271	Demo	3	4	5	6	7	8	9	10	1	2					
B-4	24761A0272 24761A0273 24761A0274	Demo	4	5	6	7	8	9	10	1	2	3	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIMENTS
B-5	24761A0276 24761A0277 24761A0278	Demo	5	6	7	8	9	10	1	2	3	4					
B-6	24761A0279 24761A0280 24761A0281	Demo	6	7	8	9	10	1	2	3	4	5					
B-7	24761A0282 24761A0283 24761A0285	Demo	7	8	9	10	1	2	3	4	5	6					
B-8	24761A0286 24761A0287 24761A0288	Demo	8	9	10	1	2	3	4	5	6	7					
B-9	24761A0289 24761A0290 24761A0291	Demo	9	10	1	2	3	4	5	6	7	8					
B-10	24761A0292 24761A0293 24761A0294 24761A0295	Demo	10	1	2	3	4	5	6	7	8	9					

DAY : FRIDAY

Batches : 24-296 TO 2C8

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
	Tentative date	04/07	11/07	18/07	25/07	01/08	08/08	22/08	12/09	19/09	26/09	03/10	10/10	17/10	24/10	31/10
	Actual date															
B-1	24761A0296 24761A0297 24761A0298	Demo	1	2	3	4	5	6	7	8	9	10				
B-2	24761A0299 24761A02A0 24761A02A1	Demo	2	3	4	5	6	7	8	9	10	1				
B-3	24761A02A2 24761A02A3 24761A02A4	Demo	3	4	5	6	7	8	9	10	1	2				
B-4	24761A02A5 24761A02A6 24761A02A7	Demo	4	5	6	7	8	9	10	1	2	3				
B-5	24761A02A8 24761A02A9 24761A02B0	Demo	5	6	7	8	9	10	1	2	3	4	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIMENTS
B-6	24761A02B1 24761A02B2 24761A02B3	Demo	6	7	8	9	10	1	2	3	4	5				
B-7	24761A02B5 24761A02B6 24761A02B7	Demo	7	8	9	10	1	2	3	4	5	6				
B-8	24761A02B8 24761A02B9 24761A02C0	Demo	8	9	10	1	2	3	4	5	6	7				
B-9	24761A02C1 24761A02C3 24761A02C4	Demo	9	10	1	2	3	4	5	6	7	8				
B-10	24761A02C5 24761A02C6 24761A02C7 24761A02C8	Demo	10	1	2	3	4	5	6	7	8	9				

PART-C

EVALUATION PROCESS (R23 Regulations):

Evaluation Task	Marks
Day – Day Evaluation	A=10
Record	B=05
Internal Exam	C=15
Cumulative Internal Examination (CIE) : A+B+C	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
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PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr A.V.RAVIKUMAR Mrs. G.TABITA**	**Mr J V PAVAN CHAND**	**Dr. B PANGEDAIAH**	**Dr.P SOBHA RANI**
Signature				

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. Y. Raghuvamsi, Dr. J. Sivavara Prasad
Course Name & Code   : DC Machines & Transformers Lab & 23EE54
L-T-P Structure   : 0-0-3   **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/EEE/III/A   **A.Y.:** 2025-26

Course Educational Objective: This course enables the student to analyze the operation of dc machines and transformers, give practical exposure on the performance of dc machines and transformers.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to

CO1	Analyze the performance of DC generators. (Apply-L3)
CO2	Examine the performance of DC motors by conducting different tests (Apply-L3)
CO3	Analyze the performance of transformers. (Apply-L3)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	3	-	-	-	3	-	-	2	3	3	-	1	-	-	3	-
CO2	3	3	-	2	2	-	-	2	3	3	-	1	-	-	3	-
CO3	3	3	-	2	2	-	-	2	3	3	-	1	-	-	3	-

List of Experiments

Any 10 of the following experiments are to be conducted:
1. Speed control of DC shunt motor by Field Current and Armature Voltage Control.
2. Brake test on DC shunt motor- Determination of performance curves.
3. Swinburne's test - Predetermination of efficiencies as DC Generator and Motor.
4. Hopkinson's test on DC shunt Machines.
5. Load test on DC compound generator-Determination of characteristics.
6. Load test on DC shunt generator-Determination of characteristics.
7. Fields test on DC series machines-Determination of efficiency.
8. Brake test on DC compound motor-Determination of performance curves.
9. OC & SC tests on single phase transformer.
10. Sumpner's test on single phase transformer.
11. Scott connection of transformers.
12. Parallel operation of Single-phase Transformers.
13. Separation of core losses of a single-phase transformer.

Online Learning Resources:
1. https://ems-iitr.vlabs.ac.in/List%20of%20experiments.html

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):

DAY: Monday
Batches: 24761A0232 - 263

B.NO.	Week/ H.T. Nos	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIV	XV	XVI	XVII
	Tentative date	30/6	07/7	14/7	21/7	28/07	4/8	11/8	18/8	1/9	8/9	15/9	22/9	6/10	8/10	13/10	27/10
	Actual date																
B-1	24761A0232 24761A0234 24761A0235	DEMO	1	2	3	4	5	6	7	8	9	10					
B-2	24761A0236 24761A0237 24761A0238	DEMO	2	3	4	5	1	7	8	9	10	6					
B-3	24761A0239 24761A0240 24761A0242	DEMO	3	4	5	1	2	8	9	10	6	7					
B-4	24761A0243 24761A0244 24761A0245	DEMO	4	5	1	2	3	9	10	6	7	8					
B-5	24761A0246 24761A0247 24761A0248	DEMO	5	1	2	3	4	10	6	7	8	9	REVISION	REVISION	REVISION	REVISION	INTERNAL EXAM
B-6	24761A0249 24761A0250 24761A0251	DEMO	1	2	3	4	5	6	7	8	9	10					
B-7	24761A0252 24761A0253 24761A0254	DEMO	2	3	4	5	1	7	8	9	10	6					
B-8	24761A0255 24761A0256 24761A0257	DEMO	3	4	5	1	2	8	9	10	6	7					
B-9	24761A0258 24761A0259 24761A0260	DEMO	4	5	1	2	3	9	10	6	7	8					
B-10	24761A0261 24761A0262 24761A0263	DEMO	5	1	2	3	4	10	6	7	8	9					

DAY: Wednesday
Batches: 23761A0204, 24761A0201 - 231

B.NO.	Week/ H.T. Nos	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV	XVI
	Tentative date	2/7	9/7	16/7	23/7	30/7	6/8	13/8	20/8	3/9	10/9	17/9	24/9	8/10	15/10	22/10	29/10
	Actual date																
B-1	23761A0204 24761A0201 24761A0202	DEMO	1	2	3	4	5	6	7	8	9	10					
B-2	24761A0203 24761A0204 24761A0205	DEMO	2	3	4	5	1	7	8	9	10	6					
B-3	24761A0206 24761A0207 24761A0208	DEMO	3	4	5	1	2	8	9	10	6	7					
B-4	24761A0209 24761A0210 24761A0211	DEMO	4	5	1	2	3	9	10	6	7	8					
B-5	24761A0212 24761A0213 24761A0214	DEMO	5	1	2	3	4	10	6	7	8	9	REVISION	REVISION	REVISION	REVISION	INTERNAL EXAM
B-6	24761A0215 24761A0216 24761A0217	DEMO	1	2	3	4	5	6	7	8	9	10					
B-7	24761A0218 24761A0219 24761A0220	DEMO	2	3	4	5	1	7	8	9	10	6					
B-8	24761A0221 24761A0223 24761A0224	DEMO	3	4	5	1	2	8	9	10	6	7					
B-9	24761A0225 24761A0226 24761A0227	DEMO	4	5	1	2	3	9	10	6	7	8					
B-10	24761A0228 24761A0229 24761A0230 24761A0231	DEMO	5	1	2	3	4	10	6	7	8	9					

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	30-06-2025	23-08-2025	8 W
I Mid Examinations	25-08-2025	30-08-2025	1 W
II Phase of Instructions	01-09-2025	01-11-2025	9 W
II Mid Examinations	03-11-2025	08-11-2025	1 W
Preparation and Practicals	10-11-2025	15-11-2025	1 W
Semester End Examinations	17-11-2025	29-11-2025	2 W

PART-C

EVALUATION PROCESS (R23 Regulations):

Evaluation Task	Marks
Day – Day Evaluation	A=10
Record	B=05
Internal Exam	C=15
Cumulative Internal Examination (CIE) : A+B+C	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	Design and develop innovative products and services in the field of Electrical and Electronics Engineering and allied engineering disciplines.
PEO2	Apply the knowledge of Electrical and Electronics Engineering to solve problems of social relevance, pursue higher education and research.
PEO3	Work effectively as individuals and as team members in multidisciplinary projects.
PEO4	Engage in lifelong learning, career enhancement and adapt to changing professional and societal needs.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr Y. Raghuvamsi Dr. J. Sivavara Prasad	Dr. J. Sivavara Prasad	Mr. P. Deepak Reddy	Dr. P. Sobha Rani
Signature				

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. Imran Abdul, Mrs. K. S. L. Lavanya
Course Name & Code : DC Machines & Transformers Lab & 23EE54
L-T-P Structure : 0-0-3   **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/EEE/III/B   **A.Y.:** 2025-26

Course Educational Objective: This course enables the student to analyze the operation of dc machines and transformers, give practical exposure on the performance of dc machines and transformers.

COURSE OUTCOMES (COs): At the end of the course, the student will be able to

CO1	Analyze the performance of DC generators. (Apply-L3)
CO2	Examine the performance of DC motors by conducting different tests (Apply-L3)
CO3	Analyze the performance of transformers. (Apply-L3)

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	-	-	-	3	-	-	2	3	3	-	1	-	-	3	-
CO2	3	3	-	2	2	-	-	2	3	3	-	1	-	-	3	-
CO3	3	3	-	2	2	-	-	2	3	3	-	1	-	-	3	-

List of Experiments

Any 10 of the following experiments are to be conducted:
1. Speed control of DC shunt motor by Field Current and Armature Voltage Control.
2. Brake test on DC shunt motor- Determination of performance curves.
3. Swinburne's test - Predetermination of efficiencies as DC Generator and Motor.
4. Hopkinson's test on DC shunt Machines.
5. Load test on DC compound generator-Determination of characteristics.
6. Load test on DC shunt generator-Determination of characteristics.
7. Fields test on DC series machines-Determination of efficiency.
8. Brake test on DC compound motor-Determination of performance curves.
9. OC & SC tests on single phase transformer.
10. Sumpner's test on single phase transformer.
11. Scott connection of transformers.
12. Parallel operation of Single-phase Transformers.
13. Separation of core losses of a single-phase transformer.

Online Learning Resources:
1. https://ems-iitr.vlabs.ac.in/List%20of%20experiments.html

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):

DAY: TUESDAY
Batches: 24-296 TO 2C8

B.NO.	Week/ H.T. Nos	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIV	XV	XVI	XVII
	Tentative date	1/7	8/7	15/7	22/7	29/7	5/8	12/8	19/8	2/9	9/9	16/9	23/9	07/10	14/10	21/10	28/10
	Actual date																
B-1	24761A0296 24761A0297 24761A0298	DEMO	1	2	3	4	5	6	7	8	9	10					
B-2	24761A0299 24761A02A0 24761A02A1	DEMO	2	3	4	5	1	7	8	9	10	6					
B-3	24761A02A2 24761A02A3 24761A02A4	DEMO	3	4	5	1	2	8	9	10	6	7					
B-4	24761A02A5 24761A02A6 24761A02A7	DEMO	4	5	1	2	3	9	10	6	7	8					
B-5	24761A02A8 24761A02A9 24761A02B0	DEMO	5	1	2	3	4	10	6	7	8	9	REVISION	REVISION	REVISION	REVISION	INTERNAL EXAM
B-6	24761A02B1 24761A02B2 24761A02B3	DEMO	1	2	3	4	5	6	7	8	9	10					
B-7	24761A02B5 24761A02B6 24761A02B7	DEMO	2	3	4	5	1	7	8	9	10	6					
B-8	24761A02B8 24761A02B9 24761A02C0	DEMO	3	4	5	1	2	8	9	10	6	7					
B-9	24761A02C1 24761A02C3 24761A02C4	DEMO	4	5	1	2	3	9	10	6	7	8					
B-10	24761A02C5 24761A02C6 24761A02C7 24761A02C8	DEMO	5	1	2	3	4	10	6	7	8	9					

DAY: FRIDAY
Batches: 23761A02A2,2A6,24761A0264-295

B.NO.	Week/ H.T. Nos	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	XIII	XIV	XV
	Tentative date	04/07	11/7	18/7	25/7	1/8	8/8	22/8	12/9	19/9	26/9	3/10	10/10	17/10	24/10	31/10
	Actual date															
B-1	23761A02A2 23761A02A6 24761A0264	DEMO	1	2	3	4	5	6	7	8	9	10				
B-2	24761A0266 24761A0267 24761A0268	DEMO	2	3	4	5	1	7	8	9	10	6				
B-3	24761A0269 24761A0270 24761A0271	DEMO	3	4	5	1	2	8	9	10	6	7				
B-4	24761A0272 24761A0273 24761A0274	DEMO	4	5	1	2	3	9	10	6	7	8				
B-5	24761A0276 24761A0277 24761A0278	DEMO	5	1	2	3	4	10	6	7	8	9	REVISION	REVISION	REVISION	INTERNAL EXAM
B-6	24761A0279 24761A0280 24761A0281	DEMO	1	2	3	4	5	6	7	8	9	10				
B-7	24761A0282 24761A0283 24761A0285	DEMO	2	3	4	5	1	7	8	9	10	6				
B-8	24761A0286 24761A0287 24761A0288	DEMO	3	4	5	1	2	8	9	10	6	7				
B-9	24761A0289 24761A0290 24761A0291	DEMO	4	5	1	2	3	9	10	6	7	8				
B-10	24761A0292 24761A0293 24761A0294 24761A0295	DEMO	5	1	2	3	4	10	6	7	8	9				

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	30-06-2025	23-08-2025	8 W
I Mid Examinations	25-08-2025	30-08-2025	1 W
II Phase of Instructions	01-09-2025	01-11-2025	9 W
II Mid Examinations	03-11-2025	08-11-2025	1 W
Preparation and Practicals	10-11-2025	15-11-2025	1 W
Semester End Examinations	17-11-2025	29-11-2025	2 W

PART-C

EVALUATION PROCESS (R23 Regulations):

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PART-D

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PROGRAMME SPECIFIC OUTCOMES (PSOs):

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PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Imran Abdul Mrs. K. S. L. Lavanya	Dr. J. Sivavara Prasad	Mr. P. Deepak Reddy	Dr. P. Sobha Rani
Signature				

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hodads@lbrce.ac.in , ads@lbrce.ac.in, Phone: 08659-222933, Fax: 08659-222931
DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. P. Gandhi Prakash
Course Name & Code   : DATA STRUCTURES LAB & 23CSS3
L-T-P Structure   : 0-1-2   **Credits:** 2
Program/Sem/Sec   : B.Tech/III/EEE-A   **A.Y.:** 2025-26

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):

CO1: Implement various searching & sorting techniques. **(Apply-L3)**
CO2: Implement Linked List, Stack & Queue data structures. **(Apply-L3)**
CO3: Design and implement algorithms for operations on binary trees and binary search trees. **(Apply-L3)**
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

COURSE ARTICULATION MATRIX (Correlation between Cos, Pos & PSOs):

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO1	PSO2	PSO3
CO1	3	2											2		
CO2	3	2											2		
CO3	3	2											2		
CO4								2	2	2					

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	**UNIT1**: 1.Program to find min & max element in an array. 2.Program to implement matrix multiplication.	4	30-06-2025 04-07-2025		
2.	3.Find an element in given list of sorted elements in an array using Binary search.	4	07-07-2025 11-07-2025		
3.	4.Implement Selection and Quick sort techniques	4	14-07-2025 18-07-2025		
4.	**UNIT:2** Write a program to implement the following operations. a. Insert b. Deletion c. Traversal	4	21-07-2025 25-07-2025		
5.	Write a program to store name, roll no, and marks of students in a class using circular double linked list	4	28-07-2025 01-08-2025		
6.	Write a program to perform addition of given two polynomial expressions using linked list	4	04-08-2025 08-08-2025		
7.	**UNIT:3** Implement stack operations using a. Arrays b. Linked list	5	11-08-2025 18-08-2025 22-08-2025		
8.	Convert given infix expression into post fix expression using stacks.	4	01-09-2025 05-09-2025		

9.	Evaluate given post fix expression using stack.	4	08-09-2025 12-09-2025		
10.	4.Write a program to reverse given linked list using stack	4	15-09-2025 19-09-2025		
11.	UNIT 4: 1.ImplementQueue operations using a. Arrays b. Linked list.	4	22-09-2025 26-09-2025		
12.	2. Implement Circular Queue using a. Arrays b. Linked list. 3.Implement Dequeue using linked list.	8	06-10-2025 10-10-2025 13-10-2025 17-10-2025		
13.	**UNIT5:** 1.Implement binary tree traversals using linked list. 2. Write program to create binary search tree for given list of integers. Perform in-order traversal of the tree. Implement insertion and deletion operations.	5	20-10-2025 24-10-2025 27-10-2025		
14.	Lab Internal Exam	3	31-10-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work& Record	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry
PSO 2	Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools.
PSO 3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.P.Gandhi Prakash	Mr.M.Kishore Kumar	Dr. D.Srinivasa Rao	Dr.P.Bhagath
Signature				

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DEPARTMENT OF ARTIFICIAL INTELLIGENCE AND DATA SCIENCE

COURSE HANDOUT

PART-A

Name of Course Instructor : **Mr. M.Kishore Kumar**
Course Name & Code : **DATA STRUCTURES using LAB & 23CSS3**
L-T-P Structure : **0-1-**2   **Credits:** 2
Program/Sem/Sec : B.Tech/III/EEE-B   **A.Y.:** 2025-26

PREREQUISITE: C Programming Language

COURSE OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):

CO1: Implement various searching & sorting techniques. **(Apply-L3)**
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CO2	3	2											2		
CO3	3	2											2		
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Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	**UNIT1**: 1.Program to find min & max element in an array. 2.Program to implement matrix multiplication.	4	03-07-2025 04-07-2025		
2.	3.Find an element in given list of sorted elements in an array using Binary search.	4	10-07-2025 11-07-2025		
3.	4.Implement Selection and Quick sort techniques	4	17-07-2025 18-07-2025		
4.	**UNIT:2** Write a program to implement the following operations. a. Insert b. Deletion c. Traversal	4	24-07-2025 25-07-2025		
5.	Write a program to store name, roll no, and marks of students in a class using circular double linked list	4	31-07-2025 01-08-2025		
6.	Write a program to perform addition of given two polynomial expressions using linked list	4	07-08-2025 08-08-2025		
7.	**UNIT:3** Implement stack operations using a. Arrays b. Linked list	7	14-08-2025 21-08-2025 22-08-2025		
8.	Convert given infix expression into post fix expression using stacks.	4	04-09-2025 05-09-2025		

9.	Evaluate given post fix expression using stack.	4	11-09-2025 12-09-2025		
10.	4.Write a program to reverse given linked list using stack	4	18-09-2025 19-09-2025		
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14.	Lab Internal Exam	3	30-10-2025		

PART-C

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PART-D

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Name of the Faculty	**Mr. M.Kishore Kumar**	**Mr. M.Kishore Kumar**	**Dr. D.Srinivasa Rao**	**Dr.P.Bhagath**
Signature				