



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
 Accredited by **NAAC** with "A" Grade & **NBA** for ASE, CE, CSE, ECE, EEE, IT & ME (Under Tier - I)
 An ISO 21001:2018, 14001:2015, 50001:2018 Certified Institution
 Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
 L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.
Phone: 08659-222933, **Fax:** 08659-222931

DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha

Course Name & Code :Chemistry&23FE02

L-T-P Structure :3-0-0

Program/Sem/Sec :IB.Tech./II-Sem/ECE-A

Credits:03

A.Y. :2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions.
- To strengthen the basic concepts of bonding models, advanced engineering materials, electrochemistry, batteries and polymers.
- To introduce instrumental methods and their applications.

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

CO1	Understand the fundamentals of quantum mechanics and molecular orbital energy diagrams for molecules. (Understand)
CO2	Summarize the suitability of advanced materials like semiconductors, superconductors, super capacitors and nano materials, in advanced fields. (Understand)
CO3	Apply Nernst equation in calculating cell potentials and understand conductometric, potentiometric titrations, electrochemical sensors and compare batteries for different applications. (Understand)
CO4	Outline the importance of polymers and conducting polymers in advanced technologies. (Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basic principles of chromatographic techniques. (Understand)

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	1
CO2	3	2	2	2	-	2	2	-	-	-	-	2
CO3	3	3	2	2	-	2	2	-	-	-	-	2
CO4	3	2	2	2	-	2	2	-	-	-	-	2
CO5	3	2	1	1	-	-	-	-	-	-	-	1
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Textbooks:

- Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
- Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference: Books:

1. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
3. Textbook of Polymer Science, Fred W. Billmeyer, Jr, 3rd Edition

PART-B**COURSE DELIVERY PLAN (LESSON PLAN): ECE-A****UNIT-I: STRUCTURE AND BONDING MODELS**

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 chemistry course, CO's & PO's Fundamentals of Quantum Mechanics	1	02-02-2026		TLM1	
2.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	03-02-2026		TLM1	
3.	Particle in one dimensional box	1	06-02-2026		TLM1	
4.	Molecular Orbital Theory – Bonding in Homonuclear diatomic molecules-Energy level diagrams (N_2 , etc)	2	07-02-2026 & 09-02-2026		TLM1	
5.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams(CO, NO, etc.)	2	10-02-2026 & 13-02-2026		TLM1	
6.	Energy level diagrams-Summary	1	14-02-2026		TLM1	
7.	π -molecular orbitals of butadiene	1	16-02-2026		TLM1	
8.	π -molecular orbitals of benzene	1	17-02-2026		TLM1	
9.	Calculation of Bond order	1	20-02-2026		TLM1	
10.	Revision and assignment	1	21-02-2026		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

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.	Semiconductors - Introduction	1	23-02-2026		TLM1	
2.	Semiconductors - Basic concept	1	24-02-2026		TLM1	
3.	Semiconductors applications	1	27-02-2026		TLM1	
4.	Super conductors - Introduction	1	28-02-2026		TLM1	
5.	Super conductors - Basic concept&Properties	1	02-03-2026		TLM1	
6.	Super conductors - applications	1	06-03-2026		TLM1	
7.	Supercapacitors - Introduction, Basic concept	1	07-03-2026		TLM1	
8.	Supercapacitors - classifications	1	09-03-2026		TLM1	
9.	Supercapacitors - applications	1	10-03-2026		TLM1	
10.	Nano materials - Introduction	1	13-03-2026		TLM2	
11.	Nano materials - classification	1	14-03-2026		TLM2	
12.	Nano materials - properties and applications of fullerenes	1	16-03-2026		TLM2	
13.	Nano materials - carbon nanotubes and graphene nanoparticles	1	17-03-2026		TLM2	
14.	Revision and assignment	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

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.	Electrochemical cell, Nernst equation	1	30-03-2026		TLM1	
2.	Cell potential calculations and numerical problems	1	31-03-2026		TLM1	
3.	Potentiometry- potentiometric titrations (redox titrations)	1	04-04-2026		TLM1	
4.	Concept of conductivity, conductivity cell,	1	06-04-2026		TLM1	

	conductometric titrations (acid-base titrations)				
5.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	07-04-2026		TLM1
6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries- working of the batteries including cell reactions	2	10-04-2026 & 11-04-2026		TLM1
7.	Fuel cells, hydrogen-oxygen fuel cell- working of the cells	1	13-04-2026		TLM1
8.	Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	17-04-2026		TLM1
9.	Revision and assignment	1	18-04-2026		TLM1
No. of classes required to complete UNIT-III: 10				No. of classes taken:	

UNIT-IV: POLYMER CHEMISTRY

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 polymers, functionality of monomers	1	20-04-2026		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	21-04-2026		TLM1	
3.	Mechanisms of polymer formation	1	24-04-2026		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	25-04-2026		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	27-04-2026 & 28-04-2026		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	01-05-2026		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	2	02-05-2026 & 04-05-2026		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	05-05-2026		TLM1	

9.	Revision and assignment	2	08-05-2026 & 09-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

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.	Electromagnetic spectrum	1	11-05-2026		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	12-05-2026		TLM1	
3.	UV-Visible Spectroscopy	1	15-05-2026		TLM1	
4.	electronic transition, Instrumentation	1	16-05-2026		TLM1	
5.	IR spectroscopy, fundamental modes	1	01-06-2026		TLM1	
6.	selection rules, Instrumentation	1	02-06-2026		TLM1	
7.	Chromatography-Basic Principle	1	05-06-2026		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	2	06-06-2026 & 08-06-2026		TLM1	
9.	Revision and assignment	1	09-06-2026		TLM1	
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

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.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	2	12-06-2026 & 13-06-2026		TLM1	

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 (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 (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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.Vijaya Dasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.T.Satyanarayana
Signature				



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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem.ECE-A
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. T. Radha Rani
COURSE COORDINATOR : Dr. K. Jhansi Rani

PRE-REQUISITES : Basics of Vectors, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enlighten the learners in the concept of differential equations and multi-variable calculus
- 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)

After completion of the course, the student will be able to

CO1: Solve the differential equations related to various engineering fields – **L3**

CO2: Apply knowledge of partial differentiation in modeling and solving of Partial differential equations – **L3**

CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence – **L3**

CO4: Evaluate the work done against a field, circulation and flux using Vector Calculus – **L3**

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

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

Dr. B. S. Grewal, "Higher Engineering Mathematics", 44nd Edition, Khanna Publishers, New Delhi, 2017.

Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

George B. Thomas, Maurice D. Weir and Joel Hass, "Thomas Calculus", 14th Edition, Pearson Publishers, 2018.

Dennis G. Zill and Warren S. Jones and Bartlett, "Advanced Engineering Mathematics", 2018.

Glyn James, "Advanced Modern Engineering Mathematics", 5th Edition, Pearson Publishers, 2018

R.K. Jain and S.R.K. Iyengar, "Advanced Engineering Mathematics", 5th Edition (9th reprint), Alpha Science International Ltd., 2021.

B. V. Ramana, "Higher Engineering Mathematics", 3rd Edition McGraw Hill Education, 2017.

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	03-02-2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	04-02-2026		TLM2			

UNIT-I: Differential Equations of first order and first degree

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.	Introduction to UNIT I	1	05-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	06-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	11-02-2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	12-02-2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	13-02-2026		TLM1	CO1	T1,T2	
10.	TUTORIAL - I	1	14-02-2026		TLM3	CO1	T1,T2	
11.	Non-exact DE Type III	1	17-02-2026		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	18-02-2026		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	19-02-2026		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	20-02-2026		TLM1	CO1	T1,T2	
15.	TUTORIAL - II	1	21-02-2026		TLM3	CO1	T1,T2	
16.	Law of natural growth and decay	1	24-02-2026		TLM1	CO1	T1,T2	
17.	Electrical circuits	1	25-02-2026		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		17			No. of classes taken:			

UNIT-II: Linear Differential equations of higher order (Constant Coefficients)

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
18.	Introduction to UNIT II	1	26-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	27-02-2026		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	28-02-2026		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	04-03-2026		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	05-03-2026		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	06-03-2026		TLM1	CO1	T1,T2	
24.	P.I for $e^{ax+b}v(x)$	1	07-03-2026		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	10-03-2026		TLM1	CO1	T1,T2	

26.	Method of Variation of parameters	1	11-03-2026		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	12-03-2026		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	13-03-2026		TLM1	CO1	T1,T2	
29.	TUTORIAL - III	1	14-03-2026		TLM3	CO1	T1,T2	
30.	Simultaneous linear equations	1	17-03-2026		TLM1	CO1	T1,T2	
31.	L-C-R circuits	1	18-03-2026		TLM1	CO1	T1,T2	
32.	Simple Harmonic motion	1	20-03-2026		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

I MID EXAMINATIONS (23-03-2026 TO 28-03-2026)

UNIT-III: Partial Differential Equations

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
33.	Introduction to Unit III	1	31-03-2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	01-04-2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	02-04-2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	04-04-2026		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	07-04-2026		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	08-04-2026		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	09-04-2026		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	10-04-2026		TLM1	CO2	T1,T2	
41.	TUTORIAL - IV	1	11-04-2026		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	15-04-2026		TLM1	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	16-04-2026		TLM1	CO2	T1,T2	
44.	Problems	1	17-04-2026					
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: Vector Differentiation

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
45.	Introduction to UNIT IV	1	18-04-2026		TLM1	CO3	T1,T2	
46.	Vector Differentiation	1	21-04-2026		TLM1	CO3	T1,T2	
47.	Gradient	1	22-04-2026		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	23-04-2026		TLM1	CO3	T1,T2	

49.	Directional Derivative	1	24-04-2026		TLM1	CO3	T1,T2	
50.	TUTORIAL V	1	25-04-2026		TLM3	CO3	T1,T2	
51.	Divergence	1	28-04-2026		TLM1	CO3	T1,T2	
52.	Curl	1	29-04-2026		TLM1	CO3	T1,T2	
53.	Problems	1	30-04-2026		TLM1	CO3	T1,T2	
54.	Solenoidal fields, Irrotational fields, potential surfaces	1	01-05-2026		TLM1	CO3	T1,T2	
55.	Solenoidal fields, Irrotational fields, potential surfaces	1	02-05-2026		TLM1	CO3	T1,T2	
56.	Laplacian, second order operators	1	05-05-2026		TLM1	CO3	T1,T2	
57.	Vector Identities	1	06-05-2026		TLM1	CO3	T1,T2	
58.	Vector Identities	1	07-05-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector 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
57.	Introduction to Unit-V	1	08-05-2026		TLM1	CO4	T1,T2	
58.	TUTORIAL -VI	1	09-05-2026		TLM3	CO4	T1,T2	
59.	Line Integral	1	12-05-2026		TLM1	CO4	T1,T2	
60.	Circulation	1	13-05-2026		TLM1	CO4	T1,T2	
61.	Work done	1	14-05-2026		TLM1	CO4	T1,T2	
62.	Surface Integral	1	15-05-2026		TLM1	CO4	T1,T2	
63.	TUTORIAL - VII	1	16-05-2026		TLM3	CO4	T1,T2	
64.	Surface Integral	1	02-06-2026		TLM1	CO4	T1,T2	
65.	Flux	1	03-06-2026		TLM1	CO4	T1,T2	
66.	Green's Theorem	1	04-06-2026		TLM1	CO4	T1,T2	
67.	Green's Theorem	1	05-06-2026		TLM1	CO4	T1,T2	
68.	TUTORIAL - VIII	1	06-06-2026		TLM3	CO4	T1,T2	
69.	Stoke's Theorem	1	09-06-2026		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	10-06-2026		TLM1	CO4	T1,T2	
71.	Divergence Theorem	1	11-06-2026		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-V		15			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
72.	Non-homogeneous Linear PDE with constant coefficients	2	12-06-2026 13-06-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			

II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)

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-CEVALUATION 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 Course Instructor	Dr. K. Jhansi Rani Course Coordinator	Dr. A. Rami Reddy Module Coordinator	Dr. T. Satyanarayana HOD
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**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

Accredited by NAAC & NBA (Under Tier - I) & ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: B Rama Krishna

Course Name & Code : Basic Civil and Mechanical Engineering & 23CM01

L-T-P Structure : 3-0-0

Credits: 3

Program/Sem/Sec : B.Tech., I-II-Sem., ECE-A

A.Y.: 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

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

CO1:	Describe various sub-divisions of Civil Engineering and to appreciate their role in societal development. (Understand)
CO2:	Outline the concepts of surveying and obtain the theoretical measurement of distances, angles and levels through surveying. (Understand)
CO3:	Classify the various materials used in construction and highway engineering and identify their appropriate usage as per the needs. (Understand)
CO4:	Illustrate the fundamental principles involved in transportation network system, their individual components and their engineering importance. (Understand)
CO5:	Explain the quality parameters of various water sources and functions of selected water storage and conveyance structures. (Understand)

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	-	-	-	2	-	2	-	-	-	-	-	2	-	2
CO2	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-
CO3	1	-	-	-	2	-	2	-	-	-	-	-	-	-	2
CO4	1	-	-	-	1	-	-	-	-	-	-	3	-	-	-
CO5	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-
	1 - Low				2 -Medium				3 - High						

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Basics of Civil Engineering**

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 CO's & PO's, Subject	1	02-02-2026		TLM2	
2.	Role of Civil Engineers in Society	1	04-02-2026		TLM2	
3.	Structural Eng., Geo-technical Eng.,- Transportation Eng.,	1	05-02-2026		TLM2	
4.	Hydraulics and Water Resources Eng., Environmental Eng.,	1	07-02-2026		TLM2	
5.	Building Construction and Planning-	1	09-02-2026		TLM2	
6.	Construction Materials-Cement -types	1	11-02-2026		TLM2	
7.	Aggregate types- Bricks- classifications	1	12-02-2026		TLM2	
8.	Steel-properties - types	1	14-02-2026		TLM2	
9.	Cement concrete- Applications	1	16-02-2026		TLM2	
10.	Introduction to Prefabricated construction Techniques, Over view- Prefabricated construction	1	18-02-2026		TLM2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: Surveying

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Objectives of Surveying, Horizontal Measurements	1	18-02-2026		TLM2	
12.	Angular Measurements, Compass survey	1	19-02-2026		TLM2	
13.	Introduction to Bearings,	1	21-02-2026		TLM2	
14.	Simple problems on bearings	1	23-02-2026		TLM2	
15.	Levelling introduction- Levelling instruments used for levelling	1	25-02-2026		TLM2	
16.	Practice problems	1	26-02-2026		TLM1	
17.	Practice problems	1	28-02-2026		TLM1	
18.	Contour mapping	1	02-03-2026		TLM1	
No. of classes required to complete UNIT-II: 8				No. of classes taken:		

UNIT-III: Transportation Engineering & Water Resources and Environmental Engineering

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	Transportation Engineering Importance of Transportation in Nation's economic development	1	05-03-2026		TLM2	
20.	Types of Highway Pavements	1	07-03-2026		TLM2	
21.	Basics of Harbour, Tunnel	1	09-03-2026		TLM2	
22.	Basics of Airport, Railway Engineering	1	11-03-2026		TLM2	
23.	Water Resources and Environmental Engineering Introduction	1	12-03-2026		TLM2	
24.	Sources of water, Quality of water- Specifications Introduction to Hydrology	1	14-03-2026		TLM2	
25.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	16-03-2026		TLM2	
26.	Simple introduction to Dams and Reservoirs	1	19-03-2026		TLM2	
No. of classes required to complete UNIT-III: 8				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 & UNIT-III)	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III)	M1=15
I-Quiz Examination (Units-I, II & UNIT-III)	Q1=10
Assignment-II (Unit- IV, V & VI)	A2=5
II- Descriptive Examination (Unit- IV, V & VI)	M2=15
II-Quiz Examination (Unit- IV, V & VI)	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.
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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.
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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.
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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	Possesses necessary skill set to analyse and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Title	Course Instructor	Course Coordinator	Head of the Department
Signature			
Name of the Faculty	B. Ramakrishna	B. Ramakrishna	Dr. K.V.Ramana



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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. BONDALA ANIL KUMAR
Course Name & Code : Introduction to Programming (23CS01)
L-T-P Structure : 4-0-0 Credits: 3
Program/Sem/Sec : B.Tech-ECE/II/A-Sec. A.Y.: 2025-26

PRE-REQUISITE: Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO):

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, the concept of algorithms and flowcharts.	Understand – Level 2
CO2:	Understand the features of C language.	Analyze – Level 4
CO3:	Interpret the problem and develop an algorithm to solve it.	Apply – Level 3
CO4:	Implement various algorithms using the C programming language.	Understand – Level 2
CO5:	Develop skills required for problem-solving and optimize the code.	Apply – Level 3

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	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
	1 – Low			2 – Medium						3 – High					

TEXTBOOKS:

T1:	The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988dition, 2015
T2:	Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

R1:	Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
R2:	Programming in C, Reema Thareja, Oxford, 2016, 2nd edition
R3:	C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT – I: Introduction to Programming and Problem Solving**

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.	Discussion of CEO's and CO's	1	03-02-2026			
2.	History of Computers	1	05-02-2026			
3.	Basic organization of a computer: ALU, input-output units. Memory, program counter	1	06-02-2026			
4.	Introduction to Programming Languages,	1	10-02-2026			
5.	Basics of a Computer Program- Algorithms	1	12-02-2026			
6.	Flowcharts (Using Dia Tool), pseudo code.	1	13-02-2026			
7.	Introduction to Compilation and Execution	1	14-02-2026			
8.	Primitive Data Types, Variables, and Constants, Basic Input and Output operations	1	17-02-2026			
9.	Type Conversion, and Casting	1	19-02-2026			
10.	Problem solving techniques: Algorithmic approach, characteristics of algorithm	1	20-02-2026			
11.	Problem solving strategies: Top-down approach, Bottom-up approach	1	21-02-2026			
12.	Time and space complexities of algorithms.	1	24-02-2026			
No. of classes required to complete UNIT – I: 12				No. of classes taken:		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Simple sequential programs Conditional Statements	1	26-02-2026			
14.	if, if-else, else if ladder	2	27-02-2026 28-02-2026			
15.	Switch statement.	1	05-03-2026			
16.	Example programs on Decision Making and Branching	1	06-03-2026			

17.	Loops: while , Example programs	1	07-03-2026			
18.	do-while, for, Example programs	2	10-03-2026 12-03-2026			
19.	Nested Loops	1	13-03-2026			
20.	Break and Continue	1	14-03-2026			
21.	Example programs on Loops	1	17-03-2026			
22.	Revision	1	20-03-2026			
No. of classes required to complete UNIT - II: 12				No. of classes taken:		

UNIT - III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Arrays Introduction, Declaration	1	31-03-2026			
24.	Array indexing, Accessing elements	1	02-04-2026			
25.	memory model	1	04-04-2026			
26.	programs with array of integers	1	07-04-2026			
27.	Introduction to two dimensional arrays	1	09-04-2026			
28.	2D Array indexing, Accessing elements	1	10-04-2026			
29.	programs with 2D arrays	1	11-04-2026			
30.	Introduction to Strings	1	14-04-2026			
31.	Reading and Writing Operations on Strings	1	16-04-2026			
32.	String Handling Functions	1	17-04-2026			
33.	Example Programs using Strings	1	18-04-2026			
No. of classes required to complete UNIT - III: 11				No. of classes taken:		

UNIT - IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction to Pointers	1	21-04-2026			
35.	dereferencing and address operators	1	23-04-2026			
36.	pointer and address arithmetic	1	24-04-2026			
37.	array manipulation using pointers	2	25-04-2026 28-04-2026			
38.	User-defined data types	1	30-04-2026			
39.	Structures , Definition and Initialization, Example programs	2	01-05-2026 02-05-2026			
40.	Unions, Example programs	1	05-05-2026			
41.	Revision	1	07-05-2026			
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
42.	Introduction to Functions	1	08-05-2026			
43.	Function Declaration and Definition	1	09-05-2026			
44.	Function call Return Types, Arguments	1	12-05-2026			

45.	modifying parameters inside functions using pointers	1	14-05-2026			
46.	arrays as parameters	2	15-05-2026 16-05-2026			
47.	Scope and Lifetime of Variables	1	01-06-2026			
48.	Introduction to Files, Basics of File Handling	2	02-06-2026 05-06-2026			
49.	Operations on Files	2	07-06-2026 08-06-2026			
No. of classes required to complete UNIT - V: 11				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	HOD Sign Weekly
56.	Application Development using C	1	09-06-2026			
57.	Introduction to Data Structures	1	12-06-2026			

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):

PO1	Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	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
PO6	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
PO7	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.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	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.

P011	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.
P012	Life-long learning: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO2	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.
PSO3	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	B. Anil Kumar	Dr. B. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				



COURSE HANDOUT

PART-A:

Program/Sem/Sec : B.Tech., ECE., II-Sem., Section – A
Academic Year : 2025-26
Course Name & Code : Network Analysis– 23EC01
L-T-P-Cr Structure : 3-0-0-3
Course Instructor : Dr. K. Ravi Kumar

Course Objectives:

1	To introduce basic laws, mesh & nodal analysis techniques for solving electrical circuits.
2	To impart knowledge on applying appropriate theorem for electrical circuit analysis.
3	To explain transient behavior of circuits in time and frequency domains.
4	To teach concepts of resonance.
5	To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

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

CO1	Apply fundamental laws and theorems to compute electrical variables of DC circuits (Apply – L3)	L3
CO2	Analyze electrical networks during transients in the Laplace domain (Apply – L3)	L3
CO3	Apply fundamental laws and theorems to compute electrical variables of AC electrical circuits (Apply – L3)	L3
CO4	Analyze resonance circuits (Analyze-L4)	L4
CO5	Evaluate variables associated with magnetic circuits (Apply – L3)	L3
CO6	Compute the parameters of a two-port network (Apply – L3)	L3

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	PO1 2	PSO 1 1	PSO 2 2	PSO 3 3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-	-	3	-
CO5	3	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO6	3	3	1	1	-	-	-	-	-	-	-	-	-	3	-

Correlation Levels: 1. Slight (Low), 2-Moderate(Medium), 3-Substantial (High).

Textbooks (T):

- T1** Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019
T2 Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.
T3 Network lines and Fields by John. D. Ryder 2 nd Edition, PHI

Reference Books(R)

- R1** D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
R2 Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7 th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
R3 Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education.

PART-B: Course Delivery Plan (Lesson Plan): B.Tech., ECE., II-Sem., Section - A

UNIT-I: Introduction and Network Theorems

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to COs and POs	1	02-02-26			
2.	Types of Circuit Components, Types of Sources	1	04-02-26			
3.	Source Transformation, Mesh Analysis	1	04-02-26			
4.	Tutorial 1	1	07-02-26			
5.	Nodal Analysis, Problem Solving with resistances only, including dependent source also	2	09-02-26 10-02-26			
6.	Principle of Duality with examples	1	10-02-26			
7.	Thevenins Theorem	1	14-02-26			
8.	Nortons Theorem	1	16-02-26			
9.	Millmans Theorem, Reciprocity Theorem	1	17-02-26			
10.	Superposition Theorem	1	17-02-26			
11.	Tutorial 2	1	21-02-26			
12.	Compensation Theorem, Substitution theorem, Maximum Power Transfer Theorem	1	23-02-26			
13.	Tellegens Theorem, Problem Solving using Dependent Sources also.	1	24-02-26			
14.	QUIZ	1	24-02-26		Innovative	
No. of classes required to complete UNIT-I: 15			No. of classes taken:			

UNIT-II: Transients and Laplace Transform

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	First Order Differential Equations, Definition of Time Constants,	1	28-02-26			
16.	RL Circuit, RC Circuit with DC excitation	1	02-03-26			
17.	Tutorial 3	1	07-03-26			
18.	Evaluating Initial conditions procedure, Second order differential equations	1	09-03-26			
19.	Homogeneous and non-homogenous, Problem Solving using R-L-C elements with DC excitation and AC excitation	2	10-03-26			
20.	Tutorial 4	1	14-03-26			

21.	Response as related to s-plane rotation of roots, Introduction to Laplace transform, Basic Theorems	1	16-03-26			
22.	Problem Solving using Laplace transform, Partial fraction expansion, Heavisides Expansion.	1	17-03-26			
23.	Group Discussion	1	17-03-26			Innovative
No. of classes required to complete UNIT-II :10			No. of classes taken:			

UNIT-III: Steady State Analysis of A.C Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Impedance Concept, Phase Angle	1	30-03-26			
25.	Series R-L, R-C Circuits- problem solving	2	31-03-26			
26.	Tutorial 5	1	04-04-26			
27.	Series R-L-C circuits- problem solving	1	06-04-26			
28.	Complex Impedance and Phasor Notation for R-L, R-C and R-L-C	2	06-04-26 07-04-26			
29.	Problem Solving using Mesh and Nodal Analysis	2	07-04-26 11-04-26			
30.	Star-Delta Conversion	1	11-04-26			
31.	Flipped Class Room - Problem Solving using Laplace Transform	1	13-04-26			
32.	Tutorial 6	1	18-04-26		Innovative	
No. of classes required to complete UNIT-III:12			No. of classes taken:			

UNIT-IV: Resonance and Coupled Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Introduction, Definition of Q	1	20-04-26			
34.	Series Resonance, Parallel Resonance	1	21-04-26			
35.	Bandwidth of series and parallel resonance	1	21-04-26			
36.	Tutorial 7	1	25-04-26			
37.	General Case - Resistant present in both branches, Anti-Resonance at all frequencies	1	27-04-26			
38.	Self Inductance, Mutual Inductance	1	28-04-26			
39.	Coefficient of Coupling, Analysis of coupled circuits, Dot rule	1	28-04-26			
40.	Tutorial 8	1	02-05-26			
41.	Conductively coupled equivalent circuits-problem solving	1	04-05-26			

42.	Peer Teaching	1	05-05-26		Innovative	
No. of classes required to complete UNIT-IV:10			No. of classes taken:			

UNIT-V: Two-Port Networks, Image and Iterative Impedances

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Relationship of two port networks	1	11-05-26			
44.	Z- Parameters, Y- Parameters	1	12-05-26			
45.	Transmission Line Parameters, h-Parameters	1	12-05-26			
46.	Tutorial 9	1	16-05-26			
47.	Relationship between parameter sets	1	01-06-26			
48.	Parallel and series connection of two port network, Cascading of Two port networks.	1	02-06-26			
49.	Problem solving using dependent sources also	1	06-06-26			
50.	Image and Iterative transfer constants	1	08-06-26			
51.	Insertion Loss, Attenuators and Pads	1	09-06-26			
52.	Lattice network and its parameters	1	09-06-26			
53.	Impedance matching networks.	1	13-06-26			
No. of classes required to complete UNIT-V:11			No. of classes taken			

Contents beyond the Syllabus

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54.	Low Pass Filter Design	1	05-05-26			
55.	High Pass Filter Design	1	09-05-26			

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:

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

Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	30
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	70
Total Marks = CIE + SEE	100

PART-D:

Program Educational Objectives (PEOs):

PEO 1:	To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO 2:	To Function professionally in the rapidly changing world with advances in technology.
PEO 3:	To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO 4:	To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner.

Program 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.

Program Specific Outcomes (PSOs):

PSO 1:	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	VLSI and Embedded Systems: 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:	Signal Processing: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Date Dr. K.Ravi Kumar Dr. K.Ravi Kumar Dr.B.V.N.R.Siva Kumar Dr.G.Srinivasulu
02.02.2026 **Course Instructor** **Course Coordinator** **Module Coordinator** **HOD**



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L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.
Phone: 08659-222933, Fax: 08659-222931

DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha&Ms.K.Sri Lakshmi
Course Name & Code : Chemistry Lab&23FE52
L-T-P Structure :0-0-3 **Credits:1.5**
Program/Sem/Sec : I B.Tech./II-Sem/ECE-A **A.Y. :2025-26**

Pre requisites: Nil

Course Educational Objective:

- To enable the students to perform different types of volumetric titrations.
- It provides an overview of preparation of polymers, nanomaterials and analytical techniques.

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

CO1: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (**Analyze**)

CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. (**Apply**)

CO3: Measure the strength of acid present in Pb-Acid battery. (**Apply**)

CO4: Analyze important parameters of water to check its suitability for drinking purpose and industrial applications. (**Analyze**)

CO5: Improve individual / teamwork skills, communication and report writing skills with ethical values. (**Apply**)

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
	CO1	3	2	-	-	-	1	2	-	-	-	-
CO2	3	-	1	-	-	2	1	-	-	-	-	-
CO3	3	2	1	-	-	-	2	-	-	-	-	-
CO4	3	1	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-
<p align="center">1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)</p>												

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 Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): ECE-A

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Chemistry lab, CO's,PO's	3	02-02-2026		TLM1	CO1	
2	Explanation of chemicals and glassware	3	09-02-2026		TLM4	CO1	
3.	Preparation of a Bakelite	3	16-02-2026		TLM4	CO2	
4.	Measuring of pH of water sample	3	23-02-2026		TLM4	CO4	
5.	Determination of amount of HCl using standard Na ₂ CO ₃ solution	3	02-03-2026		TLM4	CO1	
6.	Determination of Strength of an acid in Pb-Acid battery	3	09-03-2026		TLM4	CO3	
7.	Determination of Alkalinity of a given water sample	3	16-03-2026		TLM4	CO1	
8.	Estimation of Ferrous ion by permanganometry	3	30-03-2026		TLM4	CO1	
9.	Estimation of Ferrous ion by Dichrometry	3	06-04-2026		TLM4	CO4	
10.	Estimation of total hardness of given water sample	3	13-04-2026		TLM4	CO4	
11.	Conductometric titration of strong acid <i>versus</i> strong base	3	20-04-2026		TLM4	CO1	
12.	Conductometric titration of weak acid <i>versus</i> strong base	3	27-04-2026		TLM4	CO1	
13.	Additional experiment	3	04-05-2026		TLM4	CO1	
14.	Additional experiment/repeat	3	11-05-2026		TLM4	CO1	
15.	Additional experiment/repeat	3	01-06-2026		TLM4	CO1	
16.	Internal Exam	3	08-06-2026		TLM4	CO1	
	Total						

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation(CIE):

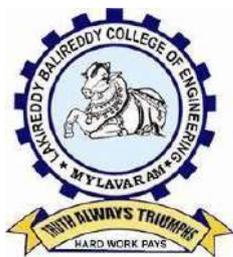
- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Evaluation Task	Marks
Day-to-Day Work	A1 = 10
Record & Observation	B1 = 5
Internal Exam	C1 = 15
Cumulative Internal Examination (CIE): (A1+B1+C1)	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

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.
PO10	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.
PO11	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.
PO12	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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.Vijaya Dasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr. T.Satyanarayana
Signature				



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DEPARTMENT OF COMPUTERSCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: BONDALA ANIL KUMAR	
Course Name & Code	: Computer Programming Lab (23CS51)	
L-T-P Structure	: 0-0-3	Credits: 1.5
Program/Sem/Sec	: B.Tech.-ECE/II Sem - A	A.Y.: 2025-26

PRE-REQUISITE: Fundamentals of Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO): The course aims to give students hands – on experience and train them on the concepts of the C- programming language.

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

CO1:	Read, understand, and trace the execution of programs written in C language. (Understand)	Apply–Level2
CO2:	Select the right control structure for solving the problem. (Apply)	Apply–Level3
CO3:	Develop C programs, which utilize memory efficiently using programming constructs like pointers. (Apply)	Apply–Level3
CO4:	Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.(Apply).	Apply–Level3
CO5:	Improve individual / teamwork skills, communication and report writing skills with ethical values.	

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	2	-	-	3	-	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-
1 -Low			2 -Medium					3- High							

PART-B

COURSE DELIVERY PLAN (LESSONPLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Week1: Familiarization with programming environment	03		06-02-2025	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		13-02-2026	DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03		20-02-2026	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		27-02-2026	DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03		06-03-2026	DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03		13-03-2026	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		20-03-2026	DM5
8.	Week8: Exercise Programs on 2 D arrays, sorting and Strings.	03		10-04-2026	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		17-04-2026	DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03		24-04-2026	DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03		01-05-2026	DM5
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	06		08-05-2026	DM5
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03		15-05-2026	DM5
14.	Week 14: Exercise Programs on File handling.	03		05-06-2026	DM5
15.	Lab Internal	03		12-06-2026	DM5

Delivery Methods			
DM1	Chalk and Talk	DM4	Assignment/Test/Quiz
DM2	ICT Tools	DM5	Laboratory/Field Visit
DM3	Tutorial	DM6	Web-based Learning

PART-C

P01	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
P02	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.
P03	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.
P04	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.
P05	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
P06	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
P07	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.
P08	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
P09	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
P010	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.
P011	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.
P012	Life-long learning: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES(PSOs):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO2	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.
PSO3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	HOD
Name of the Faculty	B. Anil Kumar	Dr. B. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech. II-Sem, ECE-A/S
ACADEMIC YEAR	: 2025-26
COURSE NAME & CODE	: Engineering Workshop, 23ME51
L-T-P STRUCTURE	: 0-0-3
COURSE CREDITS	: 1.5
COURSE INSTRUCTOR	: S. Srinivasa Reddy, Assoc. Professor, S. Uma Maheswara Reddy, Asst Professor
COURSE COORDINATOR	: Seelam Srinivasa Reddy, Assoc. Professor

PRE REQUISITE: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

COURSE OBJECTIVE:

The objective of this course is to get familiarized with various trades used in Engineering Workshop and learn the safety pre-cautions to be followed in the workshops, while working with the different tools.

COURSE OUTCOMES (CO)

CO1	Design and model different prototypes in the carpentry trade such as Cross lap joint, Dove tail joint.
CO2	Fabricate and model various basic prototypes in the trade of fitting such as Straight fit, V-fit.
CO3	Produce various basic prototypes in the trade of Tin smithy such as Rectangular tray, and open Cylinder.
CO4	Perform various basic House Wiring techniques.

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	PSO 1	PSO 2	PSO 3
CO1	3		2	3	3	3			3			2		3	2
CO2	3		2	3	3	3			3			2		3	2
CO3	3		2	3	3	3			3			2		3	2
CO4	3		2	3	3	3			3			2		3	2

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

REFERENCE:

R1	LabManual
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COURSE DELIVERY PLAN (LESSON PLAN): Section-A (BATCH-B1)

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1	Demonstration	3	04/02/2026		TLM8	R1	
2	Experiment-1	3	11/02/2026		TLM8	R1	
3	Experiment-2	3	18/02/2026		TLM8	R1	
4	Experiment-3	3	25/02/2026		TLM8	R1	
5	Experiment-4	3	04/03/2026		TLM8	R1	
6	Experiment-5	3	11/03/2026		TLM8	R1	
7	Experiment-6	3	18/03/2026		TLM8	R1	
I-Mid Examinations (23.03.2026 to 28.03.2026)							
8	Experiment-7	3	01/04/2026		TLM8	R1	
9	Experiment-8	3	08/04/2026		TLM8	R1	
10	Repetition lab	3	15/04/2026		TLM8	R1	
11	Repetition lab	3	22/04/2026		TLM8	R1	
12	Repetition lab	3	29/04/2026		TLM8		
13	Viva voce	3	06/05/2026		TLM6		
14	Viva voce	3	13/05/2026		TLM6		
15	Viva voce	3	00/06/2026		TLM6		
16	Lab Internal	3	10/06/2026				

Teaching Learning Methods

TLM1	Chalk and Talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	02-01-2026	21-03-2026	7W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	7W
Summer vacation	18-05-2026	30-05-2026	2W
II Phase of Instructions	01-06-2026	13-06-2026	2W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practical's	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	2W

Part-C

EVALUATION PROCESS:

Parameter	Marks
Day-to-Day Work	A1=10 Marks
Record And Observation	B1= 05 Marks
Internal Test	C1 = 15 Marks
Cumulative Internal Examination (CIE = A1 + B1 + C1)	A1+B1+C1=30Marks
Semester End Examinations (SEE)	D1 = 70 Marks
Total Marks : A1+B1+C1+D1	100 Marks

Details of Batches: A-SEC

Batch No.	Reg.No.of Students	Number of Students
B1	25761A0401-417	17
B2	25761A0418-434	17
B3	25761A0435-451	17
B4	25761A0452-267	16

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08
B1	C1	C2	F1	F2	P1	P2	E1	E2
B2	C2	C1	F2	F1	P2	P1	E2	E1
B3	F1	F2	C1	C2	E1	E2	P1	P2
B4	F2	F1	C2	C1	E2	E1	P2	P1

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dove tail Joint	CO1
3.	Fitting-1(F1)-T-Joint	CO2
4.	Fitting-2(F2)-V-Joint	CO2
5.	Plumbing-1(P1)-Pipe Threading practice	CO3
6.	Plumbing-2(P2)-Pipe Layout	CO3
7.	House Wiring-1(E1)-Series and Parallel connection	CO4
8.	HouseWiring-2(E2)-Fluorescent Lamp and Calling Bell Circuit	CO4

NOTIFICATION OF CYCLE:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle 1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
	2.	Carpentry-2(C2)-Dove tail Joint	CO1
	3.	Fitting-1(F1)-T-Joint	CO2
	4.	Fitting-2(F2)-V-Joint	CO2
	5.	Plumbing-1(P1)-Pipe Threading practice	CO3
Cycle 2	6.	Plumbing-2(P2)-PipeLayout	CO3
	7.	House Wiring-1(E1)-Series and Parallel Connection	CO4
	8.	House Wiring-2(E2)-Fluorescent Lamp and Calling bell Circuit	CO4

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multi disciplinary activities.

PEO3: To develop inquisitiveness towards good communication and lifelong learning.

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyses complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
- 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.
- 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.
- 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.
- 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.
- 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.
- 8. Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- 9. Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multi disciplinary settings.
- 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 instruction

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 multi-disciplinary environments.

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):

1. To apply the principles of thermal sciences to design and develop various thermal systems.
2. To apply the principles of manufacturing technology, scientific management towards Improvement of quality and optimization of engineering systems in the design, analysis and manufacture ability of products.
3. To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Course Instructors	Course Coordinator	Module Coordinator	HOD
S.Srinivasa Reddy S.Uma maheswara Reddy	S.Srinivasa Reddy	Mr.J.SubbaReddy	Dr. M. B. S Sreekara Reddy



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(Autonomous Status Since the Academic Year 2010-11 & Extended up to 2031-32)

NAAC Accredited with CGPA of 3.20 on 4-point scale at 'A' Grade

NIRF-2022 (Positioned in the Band of 251-300 in the Engineering Category)

NIRF-2023 (Positioned in the Band of 101-150 in the Innovation Category)

NBA Accredited under Tier-I (ECE, EEE, CSE, IT, ME, CIV, ASE)

Recognized as Scientific Industrial Research Organization (SIRO) by DSIR

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, N.T.R Dist., Andhra Pradesh, India.

Department of Electronics and Communication Engineering

COURSE HANDOUT

PART-A

Program/Sem/Sec	: B.Tech., ECE., II-Sem., Section – A
Academic Year	: 2025-26
Course Name & Code	: Network Analysis and Simulation Laboratory– 23EC51
L-T-P-Cr Structure	: 0-0-3-1.5
Course Instructor	: Dr. K. Ravi Kumar

PRE-REQUISITE: Basic Electrical Engineering Concepts

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To gain hands on experience in verifying Kirchoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits (Apply)
CO2	Design resonance circuit for given specifications (Analyze)
CO3	Measure time constants of RL & RC circuits (Apply)
CO4	Analyze the 1 st and 2 nd order circuits with respect to parameter variation (Analyze)
CO5	Characterize and model the network in terms of all network parameters (Apply)

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	2	2	-	1	2	-	-	-	-	2	1	2	2	1	-
CO2	2	2	-	1	2	-	-	-	-	2	2	2	3	1	-
CO3	2	2	-	1	1	-	-	-	-	2	1	2	1	2	-
CO4	2	3	-	1	2	-	-	-	-	2	1	2	2	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	1	2	-

Correlation Levels: 1-Slight (Low), 2-Moderate (Medium),

Reference Books :

- R1** Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019
- R2** Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section – A

Expt. No	Experiment/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
--	Introduction to NA Lab experiments, COs, POs and PSOs	3	05-02-2026		TLM1	
1	Study of components of a circuit and verification of KCL and KVL	3	12-02-2026		TLM4	
2	Verification of mesh and nodal analysis for AC circuits	3	19-02-2026		TLM4	
3	Verification of Superposition, Thevenin's & Norton theorems for AC circuits	3	26-02-2026		TLM4	
4	Verification of maximum power transfer theorem for AC circuits	3	05-03-2026		TLM4	
5	Study of DC transients in RL, RC and RLC circuits	3	12-03-2026		TLM4	
6	To study frequency response of various 1 st order RL & RC networks	3	02-04-2026		TLM4	
7	To study the transient and steady state response of a 2 nd order circuit by varying its various parameters and studying their effects on responses	3	09-04-2026		TLM4	
8	Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit	3	16-04-2026		TLM4	
9	Determination of open circuit (Z) and short circuit (Y) parameters	3	23-04-2026		TLM4	
10	Determination of hybrid (H) and transmission (ABCD) parameters	3	30-04-2026		TLM4	
11	Determination of hybrid (H) and transmission (ABCD) parameters	3	07-05-2026		TLM4	
12	To measure two port parameters of a twin-T network and study its frequency response.	3	14-05-2026		TLM4	
13	Experiment beyond the syllabus	3	04-06-2026		TLM4	
--	Internal Examination	3	11-06-2026			

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:

Evaluation Task	Expt. no's	Marks
Day to Day work = A	1,2,3,4,5,6,7,8...	A = 10
Record = B	1,2,3,4,5,6,7,8...	B = 05
Internal Test = C	1,2,3,4,5,6,7,8...	C = 15
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8...	30
Semester End Examinations = D	1,2,3,4,5,6,7,8...	70
Total Marks: A + B + C + D = 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:	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	VLSI and Embedded Systems: 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:	Signal Processing: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Course Instructor

Dr. K. Ravi Kumar

Course Coordinator

Mr. M. SambaSiva Reddy

Module Coordinator

Dr. B.V.N.R. Siva Kumar

HOD

Dr. G. Srinivasulu



COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. K. Samaikya

Course Name :Advanced English Language Proficiency in LSRW Skills

L-T-P Structure :1-0-0

Program/Sem/Sec : B. Tech- I -II SEM ECE-A

Academic Year :2025-26

PREREQUISITE :NIL

Course Educational Objectives:

The LSRW course is designed to enhance students' abilities in the four essential language skills: Listening, Speaking, Reading, and Writing. It focuses on improving communication effectiveness across academic, professional, and social settings.

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

CO1	Enhance active listening skills to comprehend, analyze, and respond effectively in academic and professional contexts.	L2
CO2	Develop confident and articulate speaking abilities for effective communication in formal and informal settings.	L3
CO3	Strengthen reading comprehension skills to interpret, evaluate, and synthesize information from various texts.	L3
CO4	Improve writing proficiency to produce clear, coherent, and grammatically accurate content for academic and professional purposes.	L3

Module-1: Listening Skills

- Listening & repeating 1-2 sentences
- Listening comprehension followed by MCQs

Module-2: Speaking Skills

- Pronunciation practice- Jam sessions- Video Recording
- Speaking drills (words → phrases → sentences)
- Short speech (30–60 seconds): topics & prompts

Module-3: Reading Skills

- Reading sentences and paragraphs – (TOEFL)
- Reading comprehension practice (factual & inferential)
- Synonyms, antonyms, analogy, similes (for Verbal Ability tests)

Module-4: Writing Skills

- Error spotting –Correction of sentences
- Correction of jumbled sentences (word & sentence sequencing)
- Cloze test (with options)

Module-5: Grammar - MCQs model (aligned with CTS/Infosys)

- Articles & Prepositions
- Tenses (Present, Past, Future forms)
- Active and Passive Voice
- Basic Error Identification
- Subject-Verb Agreement
- Common Errors in Usage

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.	Introduction Listening and repeating 1-2 sentences	1	04-02-2026		
2.	Listening Comprehension followed by MCQs	1	11-02-2026		
3.	Pronunciation Practice-JAM sessions- Video recording	2	18-02-2026 25-02-2026		
4.	Speaking drill (words-phrases-sentences)	1	11-03-2026		
5.	Short speech (30–60 seconds): topics & prompts	1	18-03-2026		
6.	Reading sentences and paragraphs	1	01-04-2026		
7.	Reading comprehension practice (factual & inferential)	1	08-04-2026		
8.	Synonyms, antonyms, analogy, similes (for Verbal Ability tests)	1	15-04-2026		
9.	Error spotting –Correction of sentences	1	22-04-2026		
10.	Correction of jumbled sentences (word & sentence sequencing)	1	29-04-2026		
11.	Cloze test (with options)	1	06-05-2026		
12.	Articles & Prepositions Tenses (Present, Past, Future forms)	1	13-05-2026		
13.	Basic Error Identification Subject-Verb Agreement	1	03-06-2026		
14.	Common Errors in Usage	1	10-06-2026		
No. of classes required to complete Syllabus: 15					

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs K. Samaikya	Dr R Padma Venkat	Dr R Padma Venkat	Dr. T Satyanarayana
Signature				



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DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Lakshmi V R Babu Syamala & Dr. Y. Subbareddy
Course Name & Code : Chemistry & 23FE02
L-T-P Structure : 3-0-0 **Credits: 03**
Program/Sem/Sec : I B.Tech./II Sem/ECE-B **A.Y. : 2025-26**

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions.
- To strengthen the basic concepts of bonding models, advanced engineering materials, electrochemistry, batteries and polymers.
- To introduce instrumental methods and their applications.

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

CO1	Understand the fundamentals of quantum mechanics and molecular orbital energy diagrams for molecules. (Understand)
CO2	Summarize the suitability of advanced materials like semiconductors, superconductors, super capacitors and nanomaterials, in advanced fields. (Understand)
CO3	Apply Nernst equation in calculating cell potentials and understand conductometric, potentiometric titrations, electrochemical sensors and compare batteries for different applications. (Understand)
CO4	Outline the importance of polymers and conducting polymers in advanced technologies. (Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basic principles of chromatographic techniques. (Understand)

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

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	1
CO2	3	2	2	2	-	2	2	-	-	-	-	2
CO3	3	3	2	2	-	2	2	-	-	-	-	2
CO4	3	2	2	2	-	2	2	-	-	-	-	2
CO5	3	2	1	1	-	-	-	-	-	-	-	1
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference: Books:

1. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
3. Textbook of Polymer Science, Fred W. Billmeyer, Jr, 3rd Edition

PART-B**COURSE DELIVERY PLAN (LESSON PLAN): ECE-B****UNIT-I: STRUCTURE AND BONDING MODELS**

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 chemistry course, CO's & PO's & Bridge Course	4	02-02-2026 to 07-02-2026 (02,04,05,07)		TLM1	
2.	Fundamentals of Quantum Mechanics	2	09-02-2026 & 11-02-2026		TLM 1	
3.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	12-02-2026		TLM1	
4.	Particle in one dimensional box	1	14-02-2026		TLM1	
5.	Molecular Orbital Theory – Bonding in Homonuclear diatomic molecules-Energy level diagrams (N_2 , etc)	2	16-02-2026 & 18-02-2026		TLM1	
6.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams (CO, NO, etc.)	1	19-02-2026		TLM1	
7.	Energy level diagrams-Summary	1	21-02-2026		TLM1	
8.	π -molecular orbitals of butadiene	1	23-02-2026		TLM2	
9.	π -molecular orbitals of benzene	1	25-02-2026		TLM2	
10.	Calculation of Bond order	1	26-02-2026		TLM1	
11.	Revision and assignment	1	28-02-2026		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

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.	Semiconductors – Introduction, Basic concepts	1	02-03-2026		TLM1	
2.	Semiconductors- Conduction mechanism & applications	1	04-03-2026		TLM1	
3.	Super conductors – Introduction, Basic concepts	1	05-03-2026		TLM1	
4.	Super conductors – Properties, Types and applications	1	07-03-2026		TLM1	
5.	Super capacitors - Introduction, Basic concepts	1	09-03-2026		TLM1	
6.	Super capacitors - classification & applications	1	11-03-2026		TLM1	
7.	Nano materials – Introduction, Classification	1	12-03-2026		TLM2	
8.	Nano materials - properties and applications of fullerenes	1	14-03-2026		TLM2	
9.	Nano materials - carbon nanotubes and graphene nanoparticles	1	16-03-2026		TLM2	
10.	Revision and assignment of U-II	1	18-03-2026		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

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.	Electrochemical cell, Nernst equation	2	30-03-2026 & 01-04-2026		TLM1	
2.	Cell potential calculations and numerical problems	2	02-04-2026 & 04-04-2026		TLM1	
3.	Potentiometry- potentiometric titrations (redox titrations)	1	06-04-2026		TLM1	
4.	Concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations)	1	08-04-2026		TLM1	
5.	Electrochemical sensors – potentiometric sensors	1	09-04-2026		TLM1	

	with examples, amperometric sensors with examples				
6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries- working of the batteries including cell reactions	2	11-04-2026 & 13-04-2026		TLM1
7.	Fuel cells, hydrogen-oxygen fuel cell- working of the cells	1	15-04-2026		TLM1
8.	Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	16-04-2026		TLM1
9.	Revision and assignment	1	18-04-2026		TLM1
No. of classes required to complete UNIT-III: 12				No. of classes taken:	

UNIT-IV: POLYMER CHEMISTRY

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 polymers, functionality of monomers	1	20-04-2026		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	22-04-2026		TLM1	
3.	Mechanisms of polymer formation	1	23-04-2026		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	25-04-2026		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	27-04-2026 & 29-04-2026		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	30-04-2026		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	2	02-05-2026 & 04-05-2026		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	06-05-2026		TLM1	
9.	Revision and assignment	1	07-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

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.	Electromagnetic spectrum	1	09-05-2026		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	11-05-2026		TLM1	
3.	UV-Visible Spectroscopy-Basic concepts	1	13-05-2026		TLM2	
4.	Electronic transitions and shifts	1	14-05-2026		TLM1	
5.	Instrumentation and applications of UV-Visible Spectroscopy	1	16-05-2026		TLM1	
6.	IR spectroscopy, fundamental modes	1	01-06-2026		TLM1	
7.	selection rules, Instrumentation of IR	1	03-06-2026		TLM1	
8.	Applications of IR Spectroscopy	1	04-06-2026		TLM1	
9.	Chromatography- Basic Principle and Classification	1	06-06-2026			
10.	HPLC: Instrumentation and Applications	1	08-06-2026			
11.	Revision and assignment	1	10-06-2026		TLM1	
No. of classes required to complete UNIT-V: 11				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

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.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	2	11 & 13-06-2026		TLM1	

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 (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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Lakshmi V R Babu Syamala	Dr. V.Parvathi	Dr. V.Parvathi	Dr. T.Satyanarayana
Signature				



COURSE HANDOUT

Part-A

PROGRAM	: I B. Tech., II-Sem., ECE-B
ACADEMIC YEAR	: 2025-26
COURSE NAME & CODE	: Differential Equations & Vector Calculus
L-T-P STRUCTURE	: 3-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: . G. Vijaya Lakshmi
COURSE COORDINATOR	: Dr. K. Jhansi Rani
PRE-REQUISITES	: Basics of Vectors, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enlighten the learners in the concept of differential equations and multi-variable calculus
- 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)

After completion of the course, the student will be able to

- CO1: Solve the differential equations related to various engineering fields – **L3**
CO2: Apply knowledge of partial differentiation in modeling and solving of Partial differential equations – **L3**
CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence – **L3**
CO4: Evaluate the work done against a field, circulation and flux using Vector Calculus – **L3**

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

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	-	-	1
CO2	3	1	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	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", 44nd Edition, Khanna Publishers, New Delhi, 2017.
T2 Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

- R1** George B. Thomas, Maurice D. Weir and Joel Hass, "Thomas Calculus", 14th Edition, Pearson Publishers, 2018.
R2 Dennis G. Zill and Warren S. Jones and Bartlett, "Advanced Engineering Mathematics", 2018.
R3 Glyn James, "Advanced Modern Engineering Mathematics", 5th Edition, Pearson Publishers, 2018.
R4 R.K. Jain and S.R.K. Iyengar, "Advanced Engineering Mathematics", 5th Edition (9th reprint), Alpha Science International Ltd., 2021.
R5 B. V. Ramana, "Higher Engineering Mathematics", 3rd Edition McGraw Hill Education, 2017.

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	03-02-2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	03-02-2026		TLM2			

UNIT-I: Differential Equations of first order and first degree

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.	Introduction to UNIT I	1	04-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	05-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	11-02-2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	12-02-2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	14-02-2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	17-02-2026		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	17-02-2026		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	18-02-2026		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	19-02-2026		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	21-02-2026		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	24-02-2026		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	24-02-2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		15			No. of classes taken:			

UNIT-II: Linear Differential equations of higher order (Constant Coefficients)

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
18.	Introduction to UNIT II	1	25-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	26-02-2026		TLM1	CO1	T1,T2	
20.	Finding Particular Integral, P.I for e^{ax+b}	1	28-02-2026		TLM1	CO1	T1,T2	
21.	P.I for Cos bx, or sin bx	1	04-03-2026		TLM1	CO1	T1,T2	
22.	P.I for polynomial function	1	05-03-2026		TLM1	CO1	T1,T2	
23.	P.I for $e^{ax+b}v(x)$	1	07-03-2026		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	10-03-2026		TLM1	CO1	T1,T2	

25.	Method of Variation of parameters	1	10-03-2026		TLM1	CO1	T1,T2
26.	Method of Variation of parameters	1	12-03-2026		TLM1	CO1	T1,T2
27.	Simultaneous linear equations	1	14-03-2026		TLM1	CO1	T1,T2
28.	L-C-R circuits	1	17-03-2026		TLM1	CO1	T1,T2
29.	Simple Harmonic motion	1	18-03-2026		TLM1	CO1	T1,T2
30.	TUTORIAL - II	1	17-03-2026		TLM3	CO1	T1,T2
No. of classes required to complete UNIT-II		13			No. of classes taken:		

I MID EXAMINATIONS (23-03-2026 TO 28-03-2026)

UNIT-III: Partial Differential Equations

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
31.	Introduction to Unit III	1	31-03-2026		TLM1	CO2	T1,T2	
32.	Formation of PDE by elimination of arbitrary constants	1	31-03-2026		TLM1	CO2	T1,T2	
33.	Formation of PDE by elimination of arbitrary functions	1	01-04-2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary functions	1	02-04-2026		TLM1	CO2	T1,T2	
35.	Solving of PDE	1	04-04-2026		TLM1	CO2	T1,T2	
36.	Lagrange's Method	1	07-04-2026		TLM1	CO2	T1,T2	
37.	Lagrange's Method	1	08-04-2026		TLM1	CO2	T1,T2	
38.	Homogeneous Linear PDE with constant coefficients	1	09-04-2026		TLM1	CO2	T1,T2	
39.	TUTORIAL - III	1	07-04-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

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
40.	Introduction to UNIT IV	1	11-04-2026		TLM1	CO3	T1,T2	
41.	Vector Differentiation	1	15-04-2026		TLM1	CO3	T1,T2	
42.	Gradient	1	16-04-2026		TLM1	CO3	T1,T2	
43.	Directional Derivative	1	18-04-2026		TLM1	CO3	T1,T2	
44.	Directional Derivative	1	21-04-2026		TLM1	CO3	T1,T2	
45.	Divergence	1	21-04-2026		TLM1	CO3	T1,T2	
46.	Curl	1	22-04-2026		TLM1	CO3	T1,T2	
47.	Problems	1	23-04-2026		TLM1	CO3	T1,T2	

48.	Solenoidal fields, Irrotational fields, potential surfaces	1	25-04-2026		TLM1	CO3	T1,T2	
49.	Solenoidal fields, Irrotational fields, potential surfaces	1	28-04-2026		TLM1	CO3	T1,T2	
50.	Laplacian, second order operators	1	28-04-2026		TLM1	CO3	T1,T2	
51.	Laplacian, second order operators	1	29-04-2026		TLM1	CO3	T1,T2	
52.	Vector Identities	1	30-04-2026		TLM1	CO3	T1,T2	
53.	Vector Identities	1	02-05-2026		TLM1	CO3	T1,T2	
54.	TUTORIAL IV	1	05-05-2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		15			No. of classes taken:			

UNIT-V: Vector 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
57.	Introduction to Unit-V	1	05-05-2026		TLM1	CO4	T1,T2	
58.	Line Integral	1	06-05-2026		TLM1	CO4	T1,T2	
59.	Circulation	1	07-05-2026		TLM1	CO4	T1,T2	
60.	Work done	1	09-05-2026		TLM1	CO4	T1,T2	
61.	Surface Integral	1	12-05-2026		TLM1	CO4	T1,T2	
62.	Surface Integral	1	12-05-2026		TLM1	CO4	T1,T2	
63.	Flux	1	13-05-2026		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	14-05-2026		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	16-05-2026		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	3	02-06-2026 02-06-2026 03-06-2026		TLM1	CO4	T1,T2	
67.	Divergence Theorem	3	04-06-2026 06-06-2026 09-06-2026		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	09-06-2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		16			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
69.	Non-homogeneous Linear PDE with constant coefficients	3	10-06-2026 11-06-2026 13-06-2026		TLM2	CO2	T1,T2	
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)								

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-CEVALUATION 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.

G. Vijaya Lakshmi	Dr. K. Jhansi Rani	Dr. A. RAMI REDDY	Dr. T. Satyanarayana
Course Instructor	Course Coordinator	Module Coordinator	HOD



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: M. Manoj Kumar

Course Name & Code : Basic Civil and Mechanical Engineering & 23CM01

L-T-P Structure : 3-0-0

Credits: 3

Program/Sem/Sec : B.Tech., I-II-Sem., ECE-B

A.Y.: 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

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

CO1:	Describe various sub-divisions of Civil Engineering and to appreciate their role in societal development. (Understand)
CO2:	Outline the concepts of surveying and obtain the theoretical measurement of distances, angles and levels through surveying. (Understand)
CO3:	Classify the various materials used in construction and highway engineering and identify their appropriate usage as per the needs. (Understand)
CO4:	Illustrate the fundamental principles involved in transportation network system, their individual components and their engineering importance. (Understand)
CO5:	Explain the quality parameters of various water sources and functions of selected water storage and conveyance structures. (Understand)

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	-	-	-	2	-	2	-	-	-	-	-	2	-	2
CO2	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-
CO3	1	-	-	-	2	-	2	-	-	-	-	-	-	-	2
CO4	1	-	-	-	1	-	-	-	-	-	-	3	-	-	-
CO5	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-
	1 - Low				2 - Medium				3 - High						

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Basics of Civil Engineering**

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 CO's & PO's, Subject	1	02-02-26		TLM2	
2.	Basics of Civil Engineering: Role of Civil Engineers in Society	1	05-02-26		TLM2	
3.	Various Disciplines of Civil Engineering- Structural Engineering-	1	06-02-26		TLM2	
4.	Geo-technical Engineering- Transportation Engineering	1	07-02-26		TLM2	
5.	Hydraulics and Water Resources Engineering	1	09-02-26		TLM2	
6.	Environmental Engineering-Scope of each discipline - Building Construction and Planning-	1	13-02-26		TLM2	
7.	Construction Materials-Cement -types	1	14-02-26		TLM2	
8.	Aggregate types- Bricks- classifications	1	20-02-26		TLM2	
9.	Steel-properties - types Cement concrete- Applications	1	21-02-26		TLM2	
10.	Introduction to Prefabricated construction Techniques, Over view- Prefabricated construction	1	23-02-26		TLM2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: Surveying

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.	Objectives of Surveying, Horizontal Measurements	1	26-02-26		TLM2	
2.	Angular Measurements, Compass survey	1	27-02-26		TLM2	
3.	Introduction to Bearings,	1	28-02-26		TLM2	
4.	Simple problems on bearings	1	02-03-26		TLM2	
5.	Levelling introduction-	1	05-03-26		TLM2	
6.	Practice problems	1	06-03-26		TLM2	
7.	Levelling instruments used for levelling	1	07-03-26		TLM1	
8.	Practice problems	1	07-03-26		TLM1	
9.	Practice problems	1	09-03-26		TLM2	
10.	Contour mapping	1	09-03-26		TLM2	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: Transportation Engineering & Water Resources and Environmental Engineering

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.	Transportation Engineering Importance of Transportation in Nation's economic development	1	12-03-26		TLM2	
2.	Types of Highway Pavements	1	13-03-26		TLM2	
3.	Basics of Harbour, Tunnel	1	13-03-26		TLM2	
4.	Basics of Airport, Railway Engineering	1	14-03-26		TLM2	
5.	Water Resources and Environmental Engineering Introduction	1	14-03-26		TLM2	
6.	Sources of water, Quality of water-Specifications	1	16-03-26		TLM2	
7.	Introduction to Hydrology	1	19-03-26		TLM2	
8.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	20-03-26		TLM2	
9.	Simple introduction to Dams and Reservoirs	1	21-03-26		TLM2	
No. of classes required to complete UNIT-III: 09				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 & UNIT-III)	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III)	M1=15
I-Quiz Examination (Units-I, II & UNIT-III)	Q1=10
Assignment-II (Unit- IV, V & VI)	A2=5
II- Descriptive Examination (Unit- IV, V & VI)	M2=15
II-Quiz Examination (Unit- IV, V & VI)	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 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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyse and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Title	Course Instructor	Course Coordinator	Head of the Department
Name of the Faculty	M. Manoj Kumar	B. Ramakrishna	Dr. K.V.Ramana
Signature			



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018, 14001:2015, 50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mrs. B. Usha Rani
Course Name & Code : Introduction to Programming (23CS01)
L-T-P Structure : 4-1-0 Credits: 3
Program/Sem/Sec : B.Tech. -ECE/II/B-Sec. A.Y.: 2025-26

PRE-REQUISITE: Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO):

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, concept of algorithms and flowcharts.	Understand – Level 2
CO2:	Understand the features of C language.	Analyze – Level 4
CO3:	Interpret the problem and develop an algorithm to solve it.	Apply – Level 3
CO4:	Implement various algorithms using the C programming language.	Understand – Level 2
CO5:	Develop skills required for problem-solving and optimize the code.	Apply – Level 3

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	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
	1 – Low			2 – Medium						3 – High					

TEXTBOOKS:

T1:	The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988dition, 2015
T2:	Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

R1:	Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
R2:	Programming in C, Reema Thareja, Oxford, 2016, 2nd edition
R3:	C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT – I: Introduction to Programming and Problem Solving**

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.	Discussion of CEO's and CO's	1	02-02-2026			
2.	History of Computers	1	03-02-2026			
3.	Basic organization of a computer: ALU, input-output units.	1	05-02-2026			
4.	Memory, program counter	1	07-02-2026			
5.	Introduction to Programming Languages,	1	09-02-2026			
6.	Basics of a Computer Program- Algorithms	1	10-02-2026			
7.	Flowcharts (Using Dia Tool), pseudo code.	1	12-02-2026			
8.	Introduction to Compilation and Execution	1	14-02-2026			
9.	Primitive Data Types	2	16-02-2026 17-02-2026			
10.	Variables, and Constants, Basic Input and Output operations	1	19-02-2026			
11.	Type Conversion, and Casting	1	21-02-2026			
12.	Problem solving techniques: Algorithmic approach, characteristics of algorithm	1	23-02-2026			
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	24-02-2026			
14	Time and space complexities of algorithms.	1	26-02-2026			
No. of classes required to complete UNIT – I: 15				No. of classes taken:		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Simple sequential programs Conditional Statements	1	28-02-2026			
16.	if, if-else, else if ladder	1	02-03-2026			
17.	Switch cases	1	05-03-2026			
18.	Example programs on Decision Making and Branching	2	07-03-2026 09-03-2026			

19.	Loops: while , Example programs	1	10-03-2026			
20.	do-while, for, Example programs on Loops	1	12-03-2026			
21.	Break and Continue	1	14-03-2026			
22.	Example programs on Loops	1	16-03-2026			
23.	Revision	1	17-03-2026			
No. of classes required to complete UNIT - II: 10				No. of classes taken:		

UNIT - III: Arrays and Strings

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.	Arrays Introduction, Declaration	1	30-03-2026			
25.	Array indexing, Accessing elements	1	31-03-2026			
26.	memory model	1	02-04-2026			
27.	programs with array of integers	1	04-04-2026			
28.	Introduction to two dimensional arrays	1	06-04-2026			
29.	2D Array indexing, Accessing elements	1	07-04-2026			
30.	programs with 2D arrays	1	09-04-2026			
31.	Introduction to Strings	1	11-04-2026			
32.	Reading and Writing Operations on Strings	1	13-04-2026			
33.	String Handling Functions	1	14-04-2026			
34.	Example Programs using Strings	1	16-04-2026			
No. of classes required to complete UNIT - III: 11				No. of classes taken:		

UNIT - IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to Pointers	1	18-04-2026			
36.	dereferencing and address operators	1	20-04-2026			
37.	pointer and address arithmetic	1	21-04-2026			
38.	array manipulation using pointers	2	23-04-2026			
39.			25-04-2026			
	User-defined data types	1	27-04-2026			
40.	Structures , Definition and Initialization	2	28-04-2026 30-04-2026			
41.	Example programs	1	02-05-2026			
42.	Unions	2	04-05-2026			
			05-05-2026			
43.	Example programs	1	07-05-2026			
44.	Revision	1	09-05-2026			
No. of classes required to complete UNIT - IV: 13				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
45.	Introduction to Functions	1	11-05-2026			
46.	Function Declaration and Definition	1	12-05-2026			

47.	Function call Return Types	1	14-05-2026			
48.	Arguments	1	16-05-2026			
49.	modifying parameters inside functions using pointers	1	01-06-2026			
50.	arrays as parameters	1	02-06-2026			
51.	Scope and Lifetime of Variables	1	04-06-2026			
52.	Introduction to Files	1	06-06-2026			
53.	Basics of File Handling	1	08-06-2026			
54.	Operations on Files	1	09-06-2026			
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	HOD Sign Weekly
55.	Application Development using C	1	11-06-2026			
56.	Introduction to Data Structures	1	13-06-2026			

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):

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	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
PO6	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
PO7	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.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	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.

P011	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.
P012	Life-long learning: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	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.	The ability to design and develop computer programs in networking, web applications and IoT asper the society needs.
PSO3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mrs. B. Usha Rani	Dr. B. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				

C03	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
C04	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
C05	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-
1 -Low				2 -Medium				3- High							

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Week1: Familiarization with programming environment	03		03-02-2026	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		10-02-2026	DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03		17-02-2026	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		24-02-2026	DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03		10-03-2026	DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03		17-03-2026	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		31-03-2026	DM5
8.	Week8: Exercise Program on 2 D arrays, sorting and Strings.	03		07-04-2026	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		14-04-2026	DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03		21-04-2026	DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03		28-04-2026	DM5
12.	Week 12: Exercise Programs on Recursion, the	03		05-05-2026	DM5

	structure of recursive calls				
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03		12-05-2026	DM5
14.	Week 14: Exercise Programs on File handling.	03		02-06-2026	DM5
15.	Lab Internal	03		09-06-2026	DM5

DeliveryMethods			
DM1	ChalkandTalk	DM4	Assignment/Test/Quiz
DM2	ICTTools	DM5	Laboratory/FieldVisit
DM3	Tutorial	DM6	Web-basedLearning

PART-C

P01	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
P02	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.
P03	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.
P04	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.
P05	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
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PROGRAMME SPECIFIC OUTCOMES(PSOs):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO2	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.
PSO3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	HOD
Name of the Faculty	Mrs. B. Usha Rani	Dr. B. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				



COURSE HANDOUT

PART-A:

Program/Sem/Sec : B.Tech., ECE., II-Sem., Section – B
Academic Year : 2025-26
Course Name & Code : Network Analysis– 23EC01
L-T-P-Cr Structure : 3-0-0-3
Course Instructor : Dr. K. Ravi Kumar

Course Objectives:

1	To introduce basic laws, mesh & nodal analysis techniques for solving electrical circuits.
2	To impart knowledge on applying appropriate theorem for electrical circuit analysis.
3	To explain transient behavior of circuits in time and frequency domains.
4	To teach concepts of resonance.
5	To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

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

CO1	Apply fundamental laws and theorems to compute electrical variables of DC circuits (Apply – L3)	L3
CO2	Analyze electrical networks during transients in the Laplace domain (Apply – L3)	L3
CO3	Apply fundamental laws and theorems to compute electrical variables of AC electrical circuits (Apply – L3)	L3
CO4	Analyze resonance circuits (Analyze-L4)	L4
CO5	Evaluate variables associated with magnetic circuits (Apply – L3)	L3
CO6	Compute the parameters of a two-port network (Apply – L3)	L3

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	PO1 2	PSO 1 1	PSO 2 2	PSO 3 3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	2	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-	-	3	-
CO5	3	2	1	-	-	-	-	-	-	-	-	-	-	1	-
CO6	3	3	1	1	-	-	-	-	-	-	-	-	-	3	-

Correlation Levels: 1. Slight (Low), 2-Moderate(Medium), 3-Substantial (High).

Textbooks (T):

- T1** Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019
T2 Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.
T3 Network lines and Fields by John. D. Ryder 2 nd Edition, PHI

Reference Books(R)

- R1** D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
R2 Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7 th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
R3 Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education.

PART-B: Course Delivery Plan (Lesson Plan): B.Tech., ECE., II-Sem., Section - B

UNIT-I: Introduction and Network Theorems

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to COs and POs	1	04-02-26			
2.	Types of Circuit Components, Types of Sources	1	05-02-26			
3.	Source Transformation, Mesh Analysis	1	06-02-26			
4.	Tutorial 1	1	07-02-26			
5.	Nodal Analysis, Problem Solving with resistances only, including dependent source also	2	11-02-26 12-02-26			
6.	Principle of Duality with examples	1	13-02-26			
7.	Thevenins Theorem	1	14-02-26			
8.	Nortons Theorem	1	18-02-26			
9.	Millmans Theorem, Reciprocity Theorem	1	19-02-26			
10.	Superposition Theorem	1	20-02-26			
11.	Tutorial 2	1	21-02-26			
12.	Compensation Theorem, Substitution theorem, Maximum Power Transfer Theorem	1	25-02-26			
13.	Tellegens Theorem, Problem Solving using Dependent Sources also.	1	26-02-26			
14.	QUIZ	1	27-02-26		Innovative	
No. of classes required to complete UNIT-I: 15			No. of classes taken:			

UNIT-II: Transients and Laplace Transform

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	First Order Differential Equations, Definition of Time Constants,	1	28-02-26			
16.	RL Circuit, RC Circuit with DC excitation	1	05-03-26			
17.	Tutorial 3	1	06-03-26			
18.	Evaluating Initial conditions procedure, Second order differential equations	1	07-03-26			
19.	Homogeneous and non-homogenous, Problem Solving using R-L-C elements with DC excitation and AC excitation	2	11-03-26 12-03-26			
20.	Response as related to s-plane rotation	1	13-03-26			

	of roots, Introduction to Laplace transform, Basic Theorems					
21.	Tutorial 4	1	14-03-26			
22.	Problem Solving using Laplace transform, Partial fraction expansion, Heavisides Expansion.	1	18-03-26			
23.	Group Discussion	1	20-03-26			Innovative
24.	Problems Solving	1	21-03-26			
No. of classes required to complete UNIT-II :11			No. of classes taken:			

UNIT-III: Steady State Analysis of A.C Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Impedance Concept, Phase Angle	1	01-04-26			
26.	Series R-L, R-C Circuits- problem solving	2	02-04-26			
27.	Tutorial 5	1	04-04-26			
28.	Series R-L-C circuits- problem solving	1	08-04-26			
29.	Complex Impedance and Phasor Notation for R-L, R-C and R-L-C	2	09-04-26 10-04-26			
30.	Tutorial 11	1	11-04-26			
31.	Problem Solving using Mesh and Nodal Analysis	2	15-04-26 16-04-26			
32.	Star-Delta Conversion	1	17-04-26			
33.	Flipped Class Room - Problem Solving using Laplace Transform	1	18-04-26			
No. of classes required to complete UNIT-III:11			No. of classes taken:			

UNIT-IV: Resonance and Coupled Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
34.	Introduction, Definition of Q	1	22-04-26			
35.	Series Resonance, Parallel Resonance	1	23-04-26			
36.	Bandwidth of series and parallel resonance	1	24-04-26			
37.	Tutorial 7	1	25-04-26			
38.	General Case - Resonance present in both branches, Anti-Resonance at all frequencies	1	29-04-26			
39.	Self Inductance, Mutual Inductance	1	30-04-26			
40.	Coefficient of Coupling, Analysis of coupled circuits, Dot rule	1	01-05-26			
41.	Tutorial 8	1	02-05-26			
42.	Conductively coupled equivalent	1	06-05-26			

	circuits-problem solving					
43.	Peer Teaching	1	07-05-26		Innovative	
No. of classes required to complete UNIT-IV:10			No. of classes taken:			

UNIT-V: Two-Port Networks, Image and Iterative Impedances

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Relationship of two port networks	1	08-05-26			
45.	Z- Parameters, Y- Parameters	1	09-05-26			
46.	Transmission Line Parameters, h-Parameters	1	13-05-26			
47.	Relationship between parameter sets	1	14-05-26			
48.	Parallel and series connection of two port network, Cascading of Two port networks.	1	15-05-26			
49.	Tutorial 9	1	16-05-26			
50.	Problem solving using dependent sources also	1	03-06-26			
51.	Image and Iterative transfer constants	1	04-06-26			
52.	Insertion Loss, Attenuators and Pads	1	05-06-26			
53.	Tutorial 10	1	06-06-26			
54.	Lattice network and its parameters	1	10-06-26			
55.	Impedance matching networks.	1	11-06-26			
No. of classes required to complete UNIT-V:12			No. of classes taken			

Contents beyond the Syllabus

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
56.	Low Pass Filter Design	1	12-06-26			
57.	High Pass Filter Design	1	13-06-26			

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:

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
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	30
Semester End Examination (SEE) (Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	70
Total Marks = CIE + SEE	100

PART-D:

Program Educational Objectives (PEOs):

PEO 1:	To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO 2:	To Function professionally in the rapidly changing world with advances in technology.
PEO 3:	To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO 4:	To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner.

Program 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.

Program Specific Outcomes (PSOs):

PSO 1:	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	VLSI and Embedded Systems: 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:	Signal Processing: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Date **Dr. K.Ravi Kumar** **Dr. K.Ravi Kumar** **Dr.B.V.N.R. Siva Kumar** **Dr.G.Srinivasulu**
02.02.2026 **Course Instructor** **Course Coordinator** **Module Coordinator** **HOD**



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with "A" Grade & NBA for ASE, CE, CSE, ECE, EEE, IT & ME (Under Tier - I)

An ISO 21001:2018, 14001:2015, 50001:2018 Certified Institution

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L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.

Phone: 08659-222933, Fax: 08659-222931

DIVISION OF CHEMISTRY

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Lakshmi V R Babu Syamala & Dr. Y. Subbareddy

Course Name & Code : Chemistry Lab & 23FE52

L-T-P Structure : 0-0-3

Credits: 1.5

Program/Sem/Sec : I B.Tech./II Sem/ECE-B

A.Y. : 2025-26

Pre requisites: Nil

Course Educational Objective:

- To enable the students to perform different types of volumetric titrations.
- It provides an overview of preparation of polymers, nanomaterials and analytical techniques.

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

CO1: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (**Analyze**)

CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. (**Apply**)

CO3: Measure the strength of acid present in Pb-Acid battery. (**Apply**)

CO4: Analyze important parameters of water to check its suitability for drinking purpose and industrial applications. (**Analyze**)

CO5: Improve individual / teamwork skills, communication and report writing skills with ethical values. (**Apply**)

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	1	2	-	-	-	-	-
CO2	3	-	1	-	-	2	1	-	-	-	-	-
CO3	3	2	1	-	-	-	2	-	-	-	-	-
CO4	3	1	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-
1 = Slight (Low)			2 = Moderate (Medium)					3 = Substantial (High)				

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 Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): ECE-B

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1	Introduction to Chemistry lab, CO's, PO's	3	06-02-2026		TLM1	CO1	
2	Explanation of chemicals and glassware	3	13-02-2026		TLM4	CO1	
3	Preparation of a Bakelite	3	20-02-2026		TLM4	CO2	
4	Measuring of pH of water sample	3	27-02-2026		TLM4	CO4	
5	Determination of amount of HCl using standard Na ₂ CO ₃ solution	3	06-03-2026		TLM4	CO1	
6	Determination of Strength of an acid in Pb-Acid battery	3	13-03-2026		TLM4	CO3	
7	Alkalinity of water sample	3	20-03-2026		TLM4	CO1	
8	Estimation of Ferrous ion by permanganometry	3	10-04-2026		TLM4	CO1	
9	Estimation of Ferrous ion by Dichrometry	3	17-04-2026		TLM4	CO4	
10	Estimation of total hardness of given water sample	3	24-04-2026		TLM4	CO4	
11	Conductometric titration of strong acid <i>versus</i> strong base	3	01-05-2026		TLM4	CO1	
12	Conductometric titration of weak acid <i>versus</i> strong base	3	08-05-2026		TLM4	CO1	
13	Additional experiment/repeat	3	15-05-2026		TLM4	CO1	
14	Internal Exam	3	05-06-2026 & 12-06-2026		TLM4		
	Total						

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation(CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Evaluation Task	Marks
Day-to-Day Work	A1 = 10
Record & Observation	B1 = 5
Internal Exam	C1 = 15
Cumulative Internal Examination (CIE): (A1+B1+C1)	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Lakshmi V R Babu Syamala	Dr. V.Parvathi	Dr. V.Parvathi	Dr. T.Satyanarayana
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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L.B. Reddy Nagar, Mylavaram, N.T.R. District, Andhra Pradesh-521230



DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem., ECE–B Section
ACADEMIC YEAR : 2025-26
COURSE NAME & CODE : Engineering Workshop, 23ME51
PSTRUCTURE : 0-0-3
COURSE CREDITS : 1.5
COURSE INSTRUCTOR : Mr K Lakshmi Prasad/Dr. K Murahari
COURSE COORDINATOR: Seelam Srinivasa Reddy

PRE-REQUISITE : Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

COURSE OBJECTIVE: To familiarize students with wood working, sheet metal operations, fitting, electrical house wiring skills, and basic repairs of two-wheeler vehicle.

COURSE OUTCOMES (CO)

CO1	Identify workshop tools and their operational capabilities. (Remember)
CO2	Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry, and welding. (Understand)
CO3	Modal various basic prototypes in fitting trade. (Apply)
CO4	Apply basic electrical engineering knowledge for House Wiring Practice (Apply)

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	PSO 1	PSO 2	PSO 3
CO1	3		2	3	3	3			3			2		3	2
CO2	3		2	3	3	3			3			2		3	2
CO3	3		2	3	3	3			3			2		3	2
CO4	3		2	3	3	3			3			2		3	2

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

Textbooks:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published, 2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.
2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1	Demonstration	3	02.02.2026		TLM8		
2	Experiment-1	3	09.02.2026		TLM8		
3	Experiment-2	3	16.02.2026		TLM8		
4	Experiment-3	3	23.02.2026		TLM8		
5	Experiment-4	3	02.03.2026		TLM8		
6	Experiment-5	3	09.03.2026		TLM8		
7	Experiment-6	3	16.03.2026		TLM8		
MID-1 EXAM 23.03.2026 to 28.03.2026							
8	Experiment-7	3	30.03.2026				
9.	Experiment-8	3	06.04.2026		TLM8		
10.	Demonstration of Forging	3	13.04.2026		TLM8		
11.	Demonstration of Tin Smithy	3	20.04.2026		TLM8		
12.	Repetition	3	27.04.2026		TLM8		
13.	Lab Internal	3	04.05.2026		TLM8		

Teaching Learning Methods					
TLM1	Chalk and talk	TLM4	Problem Solving	TLM7	Seminars or GD
TLM2	PPT	TLM5	Programming	TLM8	Lab Demo
TLM3	Tutorial	TLM6	Assignment or Quiz	TLM9	Case Study

Description	From	To	Weeks
I Phase of Instructions-1	02.02.2026	21.03.2026	7
I mid Examinations	23.03.2026	28.03.2026	1
II Phase of Instructions	30.03.2026	16.05.2026	7
Summer Vacation	18.05.2026	30.05.2026	2
II Phase of Instructions	01.06.2026	13.06.2026	2
II Mid Examinations	15.06.2026	20.06.2026	1
Preparation and Practical	22.06.2026	27.06.2026	1
Semester End Examinations	29.06.2026	11.07.2026	2

EVALUATION PROCESS:

Part-C

Parameter		Marks
Day-to-Day Work	Observation & Record	A1=10Marks
	Viva	A2=05Marks
Internal Test		B=15Marks
Cumulative Internal Examination		A1+A2+B=30Marks
Semester End Examinations		D=70Marks
Total Marks: A1+A2+B+C+D		100Marks

Details of Batches: B-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B1	25761A0468-483	16	B2	25761A0484-499	16
B2	25761A04A0-4B5	16	B4	25761A04B6-4D2	16

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
B1	F1	F2	C1	C2	E1	E2	P1	P2	D1	D2
B2	C1	C2	E1	E2	P1	P2	F1	F2	D1	D2
B3	E1	E2	P1	P2	F1	F2	C1	C2	D1	D2
B4	P1	P2	F1	F2	C1	C2	E1	E2	D1	D2

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO2
2.	Carpentry-2(C2)-Dovetail Joint	CO2
3.	Fitting-1(F1)-T-Joint	CO3
4.	Fitting-2(F2)-V-Joint	CO3
5.	Plumbing-1(P1)-Pipe Threading practice	CO2
6.	Plumbing-2(P2)-Pipe Layout	CO2
7.	House Wiring-1(E1)-Series and Parallel connection	CO4
8.	House Wiring-2(E2)-Fluorescent Lamp and Calling Bell Circuit	CO4
9.	Black Smithy(D1)	CO2
10.	Tin Smithy(D2)	CO2

NOTIFICATION OF CYCLE

Cycle	Exp · No	Name of the Experiment	Related CO
Cycle-1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO 2
	2.	Carpentry-2(C2)-Dovetail Joint	CO 2
	3.	Fitting-1(F1)-T-  oint	CO 3
	4.	Fitting-2(F2)-V-  oint	CO 3
	5.	Plumbing-1(P1)-Pipe Threading practice	CO 2
	6.	Plumbing-2(P2)-Pipe Layout	CO 2
	7.	HouseWiring-1(E1)–Series and Parallel Connection	CO 4
	8.	HouseWiring-2(E2)–Fluorescent Lamp and Calling bell Circuit	CO 4
Cycle-2	9.	Black Smithy(D1)	CO 2
	10.	Tin Smithy(D2)	CO 2

PART-D

Program Educational Objectives (PEOs):

PEO1: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.

PEO3: To develop inquisitiveness towards good communication and lifelong learning.

Program Outcomes (POs):

PO1 - Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - 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.

PO3 - 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.

PO4 - 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.

PO5 - 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.

PO6 - 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.

PO7 - 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.

PO8 - Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO9 - Individual and Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - 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.

PO11 - Project Management and Finance: Demonstrate knowledge and understanding of the ring 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.

PO12 - 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.

Program Specific Outcomes (PSOs):

PSO1: To apply the principles of thermal sciences to design and develop various thermal systems.

PSO2: To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.

PSO3: To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Signature				
Name of the Faculty	Mr. K Lakshmi Prasad	Mr. S Srinivasa Reddy	Dr. M. B. S. Sreekara Reddy	Dr. M. B. S. Sreekara Reddy
Designation / Title	Sr Asst. Professor / Course Instructor	Associate Professor / Course Coordinator	Professor/ Module Coordinator	Professor / Head of the Department



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(Autonomous Status Since the Academic Year 2010-11 & Extended up to 2031-32)

NAAC Accredited with CGPA of 3.20 on 4-point scale at 'A' Grade

NIRF-2022 (Positioned in the Band of 251-300 in the Engineering Category)

NIRF-2023 (Positioned in the Band of 101-150 in the Innovation Category)

NBA Accredited under Tier-I (ECE, EEE, CSE, IT, ME, CIV, ASE)

Recognized as Scientific Industrial Research Organization (SIRO) by DSIR

Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada

L.B.Reddy Nagar, Mylavaram-521230, N.T.R Dist., Andhra Pradesh, India.

Department of Electronics and Communication Engineering

COURSE HANDOUT

PART-A

Program/Sem/Sec	: B.Tech., ECE., II-Sem., Section – B
Academic Year	: 2025-26
Course Name & Code	: Network Analysis and Simulation Laboratory– 23EC51
L-T-P-Cr Structure	: 0-0-3-1.5
Course Instructor	: Dr. K. Ravi Kumar

PRE-REQUISITE: Basic Electrical Engineering Concepts

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To gain hands on experience in verifying Kirchoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits (Apply)
CO2	Design resonance circuit for given specifications (Analyze)
CO3	Measure time constants of RL & RC circuits (Apply)
CO4	Analyze the 1 st and 2 nd order circuits with respect to parameter variation (Analyze)
CO5	Characterize and model the network in terms of all network parameters (Apply)

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	2	2	-	1	2	-	-	-	-	2	1	2	2	1	-
CO2	2	2	-	1	2	-	-	-	-	2	2	2	3	1	-
CO3	2	2	-	1	1	-	-	-	-	2	1	2	1	2	-
CO4	2	3	-	1	2	-	-	-	-	2	1	2	2	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	1	2	-

Correlation Levels: 1-Slight (Low), 2-Moderate (Medium),

Reference Books :

- R1** Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019
- R2** Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9th Edition 2020.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section – B

Expt. No	Experiment/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
--	Introduction to NA Lab experiments, COs, POs and PSOs	3	04-02-2026		TLM1	
1	Study of components of a circuit and verification of KCL and KVL	3	11-02-2026		TLM4	
2	Verification of mesh and nodal analysis for AC circuits	3	18-02-2026		TLM4	
3	Verification of Superposition, Thevenin's & Norton theorems for AC circuits	3	25-02-2026		TLM4	
4	Verification of maximum power transfer theorem for AC circuits	3	11-03-2026		TLM4	
5	Study of DC transients in RL, RC and RLC circuits	3	18-03-2026		TLM4	
6	To study frequency response of various 1 st order RL & RC networks	3	01-04-2026		TLM4	
7	To study the transient and steady state response of a 2 nd order circuit by varying its various parameters and studying their effects on responses	3	08-04-2026		TLM4	
8	Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit	3	15-04-2026		TLM4	
9	Determination of open circuit (Z) and short circuit (Y) parameters	3	22-04-2026		TLM4	
10	Determination of hybrid (H) and transmission (ABCD) parameters	3	29-04-2026		TLM4	
11	Determination of hybrid (H) and transmission (ABCD) parameters	3	06-05-2026		TLM4	
12	To measure two port parameters of a twin-T network and study its frequency response.	3	13-05-2026		TLM4	
13	Experiment beyond the syllabus	3	03-06-2026		TLM4	
--	Internal Examination	3	10-06-2026			

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:

Evaluation Task	Expt. no's	Marks
Day to Day work = A	1,2,3,4,5,6,7,8...	A = 10
Record = B	1,2,3,4,5,6,7,8...	B = 05
Internal Test = C	1,2,3,4,5,6,7,8...	C = 15
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8...	30
Semester End Examinations = D	1,2,3,4,5,6,7,8...	70
Total Marks: A + B + C + D = 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:	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	VLSI and Embedded Systems: 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:	Signal Processing: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Course Instructor

Dr. K. Ravi Kumar

Course Coordinator

Mr. M. SambaSiva Reddy

Module Coordinator

Dr. B.V.N.R. Siva Kumar

HOD

Dr. G. Srinivasulu



COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. Battula Mohan Teja

Course Name :Advanced English Language Proficiency in LSRW Skills

L-T-P Structure :1-0-0

Programme/Sem/Sec : I. B. Tech -II SEM- ECE- B

Academic Year :2025-26

PREREQUISITE :NIL

Course Educational Objectives:

The LSRW course is designed to enhance students' abilities in the four essential language skills: Listening, Speaking, Reading, and Writing. It focuses on improving communication effectiveness across academic, professional, and social settings.

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

CO1	Enhance active listening skills to comprehend, analyze, and respond effectively in academic and professional contexts.	L2
CO2	Develop confident and articulate speaking abilities for effective communication in formal and informal settings.	L3
CO3	Strengthen reading comprehension skills to interpret, evaluate, and synthesize information from various texts.	L3
CO4	Improve writing proficiency to produce clear, coherent, and grammatically accurate content for academic and professional purposes.	L3

Module-1: Listening Skills

- Listening & repeating 1-2 sentences
- Listening comprehension followed by MCQs

Module-2: Speaking Skills

- Pronunciation practice- Jam sessions- Video Recording
- Speaking drills (words → phrases → sentences)
- Short speech (30–60 seconds): topics & prompts

Module-3: Reading Skills

- Reading sentences and paragraphs – (TOEFL)
- Reading comprehension practice (factual & inferential)
- Synonyms, antonyms, analogy, similes (for Verbal Ability tests)

Module-4: Writing Skills

- Error spotting –Correction of sentences
- Correction of jumbled sentences (word & sentence sequencing)
- Cloze test (with options)

Module-5: Grammar - MCQs model (aligned with CTS/Infosys)

- Articles & Prepositions
- Tenses (Present, Past, Future forms)
- Active and Passive Voice
- Basic Error Identification
- Subject-Verb Agreement
- Common Errors in Usage

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.	Introduction Listening and repeating 1-2 sentences	1	06-02-2026		
2.	Listening Comprehension followed by MCQs	1	13-02-2026		
3.	Pronunciation Practice-JAM sessions-Video recording	1	20-02-2026		
4.	Speaking drill (words-phrases-sentences)	1	27-02-2026		
5.	Short speech (30–60 seconds): topics & prompts	1	06-03-2026		
6.	Reading sentences and paragraphs	1	13-03-2026		
7.	Reading comprehension practice (factual & inferential)	1	20-03-2026		
8.	Synonyms, antonyms, analogy, similes (for Verbal Ability tests)	1	10-04-2026		
9.	Error spotting –Correction of sentences	1	17-04-2026		
10.	Correction of jumbled sentences (word & sentence sequencing)	1	24-04-2026		
11.	Cloze test (with options)	1	01-05-2026		
12.	Articles & Prepositions Tenses (Present, Past, Future forms)	2	08-05-2026 15-05-2026		
13.	Basic Error Identification Subject-Verb Agreement	1	05-06-2026		
14.	Common Errors in Usage	1	12-06-2026		
No. of classes required to complete Syllabus: 15					

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. Mohan Teja	Dr. R Padma Venkat	Dr. R Padma Venkat	Dr. T Satyanarayana
Signature				



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L B Reddy Nagar, Mylavaram-521 230, NTR District, Andhra Pradesh.

DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. M.Sambasiva Reddy
Course Name & Code : Network Analysis and Simulation Laboratory– 23EC51
L-T-P Structure : 0-0-3 Credits : 1.5
Program/Sem/Sec : B.Tech., ECE., II-Sem., Section- D A.Y : 2025-26

PRE-REQUISITE: Basic Electrical Engineering Concepts

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To gain hands on experience in verifying Kirchoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits (Apply)
CO2	Design resonance circuit for given specifications (Analyze)
CO3	Measure time constants of RL & RC circuits (Apply)
CO4	Analyze the 1 st and 2 nd order circuits with respect to parameter variation (Analyze)
CO5	Characterize and model the network in terms of all network parameters (Apply)

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	2	2	-	1	2	-	-	-	-	2	1	2	2	1	-
CO2	2	2	-	1	2	-	-	-	-	2	2	2	3	1	-
CO3	2	2	-	1	1	-	-	-	-	2	1	2	1	2	-
CO4	2	3	-	1	2	-	-	-	-	2	1	2	2	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	1	2	-

Correlation Levels: 1-Slight (Low), 2-Moderate (Medium), 3-Substantial (High) and No correlation: '-'

PART-B**COURSE DELIVERY PLAN (LESSON PLAN): Section – D**

Exp t. No	Experiment/s	COs	No. of Classes Require d	Tentative Date of Completi on	Actual Date of Completi on	Teachi ng Learni ng Metho ds	HOD Sign Weekl y
--	Introduction to NA Lab experiments, COs, POs and PSOs	--	3	07-02-26		TLM1	
Cycle – I							
1	Experiment – 1	CO1,CO4	3	14-02-26		TLM4	
2	Experiment – 2	CO1,CO4	3	21-02-26		TLM4	
3	Experiment – 3	CO1,CO4	3	28-03-26		TLM4	
4	Experiment – 4	CO1,CO4	3	07-03-26		TLM4	
5	Experiment – 5	CO1,CO4	3	14-03-26		TLM4	
6	Experiment – 6	CO2,CO4	3	04-04-26		TLM4	
Cycle – II							
7	Experiment – 7	CO1,CO4	3	11-04-26		TLM4	
8	Experiment – 8	CO1,CO4	3	18-04-26		TLM4	
9	Experiment – 9	CO2,CO4	3	25-04-26		TLM4	
10	Experiment – 10	CO3,CO4	3	02-05-26		TLM4	
11	Experiment – 11	CO3,CO4	3	09-05-26		TLM4	
12	Experiment – 12	CO3,CO4	3	16-05-26		TLM4	
13	Experiment beyond the syllabus		3	06-06-26		TLM4	
--	Internal Examination	--	3	13-06-26			

Experiments to be conducted:

Exp. No	CYCLE-1	Exp. No	CYCLE-2
1	Study of components of a circuit and Verification of KCL and KVL	7	To study the transient and steady state response of a 2 nd order circuit by varying its various parameters and studying their effects on responses
2	Verification of mesh and nodal analysis for AC circuits	8	Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit
3	Verification of Superposition, Thevenin's & Norton theorems for AC circuits	9	Determination of open circuit (Z) and short circuit (Y) parameters
4	Verification of maximum power transfer theorem for AC circuits	10	Determination of hybrid (H) and transmission (ABCD) parameters
5	Study of DC transients in RL, RC and RLC circuits	11	Determination of hybrid (H) and transmission (ABCD) parameters
6	To study frequency response of various 1 st order RL & RC networks	12	To measure two port parameters of a twin-T network and study its frequency response.

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:**

Evaluation Task	Expt. no's	Marks
Day to Day work = A	1,2,3,4,5,6,7,8...	A = 10
Record = B	1,2,3,4,5,6,7,8...	B = 05
Internal Test = C	1,2,3,4,5,6,7,8...	C = 15
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8...	30
Semester End Examinations = D	1,2,3,4,5,6,7,8...	70
Total Marks: A + B + C + D = 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:	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	VLSI and Embedded Systems: 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:	Signal Processing: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Course Instructor
Mr. M.Sambasiva Reddy

Course Coordinator
Dr.B.Siva Hari Prasad

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HOD
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. G.Minni
Course Name & Code : Introduction to Programming (23CS01)
L-T-P Structure : 3-0-0 Credits: 3
Program/Sem/Sec : B.Tech.-ECE/II Sem./C Section A.Y.: 2025-26
PRE-REQUISITE: : Mathematics, Basic Computer concepts

COURSE EDUCATIONAL OBJECTIVE (CEO):

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, concept of algorithms and flowcharts.	Understand – L2
CO2:	Understand the features of C language.	Understand – L2
CO3:	Interpret the problem and develop an algorithm to solve it.	Apply – L3
CO4:	Implement various algorithms using the C programming language.	Apply – L3
CO5:	Develop skills required for problem-solving and optimizing the code.	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
CO1	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	2	-	-
	1 – Low				2 – Medium				3 – High						

TEXTBOOKS:

- T1:** "The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988, Edition, 2015.
- T2:** Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996.

REFERENCE BOOKS:

- R1:** Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
- R2:** Programming in C, Reema Thareja, Oxford, 2016, 2nd edition.
- R3:** C Programming, A Problem-Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Programming and Problem Solving

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.	Discussion of CEO's and CO's	1	02-02-2026		TLM1	
2.	History of Computers	1	02-02-2026		TLM1	
3.	Basic organization of a computer: ALU, input-output units.	1	05-02-2026		TLM1	
4.	Memory, program counter	1	06-02-2026		TLM1	
5.	Introduction to Programming Languages,	1	09-02-2026		TLM1	
6.	Basics of a Computer Program- Algorithms	1	12-02-2026		TLM1	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	13-02-2026		TLM1	
8.	Introduction to Compilation and Execution	1	14-02-2026		TLM1	
9.	Primitive Data Types	1	16-02-2026		TLM1	
10.	Variables, and Constants, Basic Input and Output operations	1	19-02-2026		TLM1	
11.	Type Conversion, and Casting	1	20-02-2026		TLM1	
12.	Problem solving techniques: Algorithmic approach, characteristics of algorithm	1	21-02-2026		TLM1	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	23-02-2026		TLM1	
14.	Time and space complexities of algorithms.	1	26-02-2026		TLM1	
No. of classes required to complete UNIT – I: 13				No. of classes taken:		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Simple sequential programs Conditional Statements	1	27-02-2026		TLM1	
16.	if, if-else	1	28-02-2026		TLM1	
17.	Else-if ladder, nested if	1	02-03-2026		TLM1	
18.	Switch, sample programs	1	05-03-2026		TLM1	
19.	Example programs on DecisionMaking and Branching	1	06-03-2026		TLM1	
20.	Loops: while , Example programs	1	07-03-2026		TLM1	
21.	Loops: do-while, Example programs	1	09-03-2026		TLM1	
22.	Loops: for, Example programs	1	12-03-2026		TLM1	
23.	Break , Example programs	1	13-03-2026		TLM1	
24.	Continue, Example programs	1	14-03-2026		TLM1	
25.	Goto Example programs	1	16-03-2026		TLM1	
26.	Example programs on loops	1	20-03-2026		TLM1	
27.	Example programs on loops	1	30-03-2026		TLM1	
28.	Revision	1	02-04-2026		TLM1	
No. of classes required to complete UNIT – II: 14				No. of classes taken:		

UNIT – III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
29.	Arrays Introduction, Declaration	1	04-04-2026		TLM1	
30.	Array indexing, Accessing elements	1	06-04-2026		TLM1	
31.	programs with array of integers	1	09-04-2026		TLM1	
32.	Introduction to two dimensional arrays	1	10-04-2026		TLM1	
33.	2D Array indexing, Accessing elements	1	11-04-2026		TLM1	
34.	programs with 2D arrays	1	13-04-2026		TLM1	
35.	Introduction to Strings	1	16-04-2026		TLM1	
36.	Reading and Writing Operations on Strings, String Handling Functions	1	17-04-2026		TLM1	
37.	Example Programs using Strings	1	18-04-2026		TLM1	
38.	Revision	1	20-04-2026		TLM1	
No. of classes required to complete UNIT – III: 10				No. of classes taken:		

UNIT – IV: Pointers & User Defined Data types

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.	Introduction to Pointers	1	23-04-2026		TLM1	
40.	dereferencing and address operators	1	24-04-2026		TLM1	
41.	pointer and address arithmetic	1	25-04-2026		TLM1	
42.	array manipulation using pointers	1	30-04-2026		TLM1	
43.	User-defined data types	1	01-05-2026		TLM1	
44.	Structures, Definition and Initialization	1	02-05-2026		TLM1 TLM1	
45.	Example programs	1	04-05-2026		TLM1	
46.	Unions introduction, syntax	1	07-05-2026		TLM1 TLM1	
47.	Example programs	1	08-05-2026		TLM1	
48.	Revision	1	09-05-2026		TLM1	
No. of classes required to complete UNIT – IV: 10				No. of classes taken:		

UNIT – V: Functions and File Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
49.	Introduction to Functions	1	11-05-2026		TLM1	
50.	Function Declaration and Definition	1	14-05-2026		TLM1	
51.	Function call Return Types	1	15-05-2026		TLM1	
52.	Arguments	1	16-05-2026		TLM1	
53.	modifying parameters inside functions using pointers	1	01-06-2026		TLM1	
54.	arrays as parameters	1	04-06-2026		TLM1	
55.	Scope and Lifetime of Variables	1	05-06-2026		TLM1	
56.	Storage classes examples	1	06-06-2026		TLM1	
57.	Introduction to Files	1	08-06-2026		TLM1	
58.	Basics of File Handling, examples	1	11-06-2026		TLM1	
59.	Operations on Files examples	1	12-06-2026		TLM1	
60.	Revision	1	13-06-2026		TLM1	
No. of classes required to complete UNIT – V: 12				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, 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):

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.
PO5	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
PO6	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
PO7	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.
PO8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	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.
PO11	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.
PO12	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):

PSO1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.G.Minni			
Signature				



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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSEHANDOUT

PART-A

Name of Course Instructor	: Dr. G.Minni	
Course Name & Code	: Computer Programming Lab (23CS51)	
L-T-P Structure	: 0-0-3	Credits:1.5
Program/Sem/Sec	: B.Tech.–ECE /II-Sem/C	A.Y. :2025-26

PRE-REQUISITE: Fundamentals of Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO): The course aims to give students hands – on experience and train them on the concepts of the C- programming language.

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

CO1:	Read, understand, and trace the execution of programs written in C language. (Understand)	Apply–Level2
CO2:	Select the right control structure for solving the problem. (Apply)	Apply–Level3
CO3:	Develop C programs which utilize memory efficiently using programming constructs like pointers. (Apply)	Apply–Level3
CO4:	Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C. (Apply).	Apply–Level3
CO5:	Improve individual / teamwork skills, communication and report writing skills with ethical values.	Apply–Level3

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	2	-	-	3	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	-	3	-	-	-	-	-	-	-	3	-	-
CO3	3	2	2	-	3	-	-	-	-	-	-	-	3	-	-
CO4	3	2	2	-	3	-	-	-	-	-	-	-	3	-	-
CO5	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-
1 –Low			2 –Medium						3– High						

PART-B

COURSE DELIVERY PLAN -LESSONPLAN:

S No.	Programs to be covered	No. of Classes		Actual Date of Completion	Delivery Method	HOD Sign.
		Required as per the Schedule	Tentative Date of Completion			
1.	Week1: Familiarization with programming environment Problem-solving using Algorithms and Flow charts.	03	14-02-2026		TLM4	
2.	Week2: Exercise Programs on Variable types and type conversions	03	21-02-2026		TLM4	
3.	Week3: Exercise Programs on Operators and the precedence and as associativity.	03	28-02-2026		TLM4	
4.	Week4: Exercise Programs on Branching and logical expressions	03	07-03-2026		TLM4	
5.	Week5: Exercise Programs on Loops, while and for loops	03	14-03-2026		TLM4	
6.	Week6: Exercise Programs on 1 D Arrays & searching.	03	04-04-2026		TLM4	
7.	Week7: ExerciseProgramson2 D arrays, sorting and Strings.	03	11-04-2026		TLM4	
8.	Week8: Exercise Programs on Pointers, structures and dynamic memory allocation	03	18-04-2026		TLM4	
9.	Week9: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03	25-04-2026		TLM4	
10.	Week10: Exercise Programs on Functions, call by value, scope and extent.	03	02-05-2026		TLM4	
11.	Week 11: Exercise Programs on Recursion, the structure of recursive calls	03	09-05-2026		TLM4	
12.	Week 12: Exercise Programs on Call by reference, dangling pointers	03	16-05-2026		TLM4	
13.	Week 13: Exercise Programs on File handling.	03	06-06-2026		TLM4	
14	Week 14: Lab Internal Test	03	13-06-2026		TLM4	

Delivery Methods			
DM1	Chalk and Talk	DM4	Assignment/Test/Quiz
DM2	ICT Tools	DM5	Laboratory/Field Visit
DM3	Tutorial	DM6	Web-based Learning

PART-C

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
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	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2	VLSI and Embedded Systems: 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	Signal Processing: 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	Dr. G. Minni			
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with "A" Grade & NBA for ASE, CE, CSE, ECE, EEE, ME & IT (Under Tier - I)

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L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.

Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	: I B. Tech., II-Sem., ECE-C
ACADEMIC YEAR	: 2025-26
COURSE NAME & CODE	: Differential Equations & Vector Calculus
L-T-P STRUCTURE	: 3-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: Mrs.Pathan Kalma Begum
COURSE COORDINATOR	: Dr. K.Jhansi Rani
PRE-REQUISITES	: Basics of Vectors, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enlighten the learners in the concept of differential equations and multivariable calculus
- 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)

After completion of the course, the student will be able to

CO1: Solve the differential equations related to various engineering fields – L3

CO2: Apply knowledge of partial differentiation in modeling and solving of Partial differential equations – L3

CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence – L3

CO4: Evaluate the work done against a field, circulation and flux using Vector Calculus – L3

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

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	-	-	1
CO2	3	1	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	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, New Delhi, 2017.

T2 Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "Thomas Calculus", 14th Edition, Pearson Publishers, 2018.

R2 Dennis G. Zill and Warren S. Jones and Bartlett, "Advanced Engineering Mathematics", 2018.

R3 Glyn James, “Advanced Modern Engineering Mathematics”, 5th Edition, Pearson Publishers, 2018.

R4 R.K. Jain and S.R.K. Iyengar, “Advanced Engineering Mathematics”, 5th Edition (9th reprint), Alpha Science International Ltd., 2021.

R5 B. V. Ramana, “Higher Engineering Mathematics”, 3rd Edition McGraw Hill Education, 2017.

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	03/02/2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	04/02/2026		TLM2			

UNIT-I: Differential Equations of first order and first degree

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.	Introduction to UNIT I	1	05/02/2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	05/02/2026		TLM1	CO1	T1,T2	
5.	Bernoulli’s DE	1	06/02/2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	10/02/2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	11/02/2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	12/02/2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	12/02/2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	13/02/2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	17/02/2026		TLM1	CO1	T1,T2	
12.	Newton’s Law of cooling	1	18/02/2026		TLM3	CO1	T1,T2	
13.	Law of natural growth and decay	1	19/02/2026		TLM1	CO1	T1,T2	
14.	TUTORIAL - 1	1	19/02/2026		TLM1	CO1	T1,T2	
15.	Electrical circuits	1	20/02/2026		TLM1	CO1	T1,T2	
16.	TUTORIAL - 2	1	24/02/2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

UNIT-II: Linear Differential equations of higher order (Constant Coefficients)

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	25/02/2026		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	26/02/2026		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	26/02/2026		TLM1	CO1	T1,T2	
20.	P.I for Cos bx, or sin bx	1	27/02/2026		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	04/03/2026		TLM1	CO1	T1,T2	
22.	TUTORIAL - 3	1	05/03/2026		TLM3	CO1	T1,T2	

23.	P.I for $e^{ax+b}v(x)$	1	05/03/2026		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	06/03/2026		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	10/03/2026		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	11/03/2026		TLM1	CO1	T1,T2	
27.	TUTORIAL - 4	1	12/03/2026		TLM3	CO1	T1,T2	
28.	Simultaneous linear equations	1	12/03/2026		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	13/03/2026		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	17/03/2026		TLM1	CO1	T1,T2	
31.	TUTORIAL - 5	1	18/03/2026		TLM3	CO1	T1,T2	
32.	Revision	1	20/03/2026					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

I MID EXAMINATIONS (23-03-2026 TO 28-03-2026)

UNIT-III: Partial Differential Equations

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
33.	Introduction to Unit III	1	31/03/2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	01/04/2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	02/04/2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	02/04/2026		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	07/04/2026		TLM1	CO2	T1,T2	
38.	TUTORIAL - 6	1	08/04/2026		TLM3	CO2	T1,T2	
39.	Lagrange's Method	1	09/04/2026		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	9/04/2026		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	10/04/2026		TLM1	CO2	T1,T2	
42.	TUTORIAL - 7	1	15/04/2026		TLM3	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	16/04/2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

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
44.	Introduction to UNIT IV	1	16/04/2026		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	17/04/2026		TLM1	CO3	T1,T2	

46.	Gradient	1	21/04/2026		TLM1	CO3	T1,T2	
47.	TUTORIAL - 8	1	22/04/2026		TLM3	CO3	T1,T2	
48.	Directional Derivative	1	23/04/2026		TLM1	CO3	T1,T2	
49.	Divergence	1	23/04/2026		TLM1	CO3	T1,T2	
50.	Curl	1	24/04/2026		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	28/04/2026		TLM1	CO3	T1,T2	
52.	TUTORIAL - 9	1	29/04/2026		TLM3	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	30/04/2026		TLM1	CO3	T1,T2	
54.	Laplacian, second order operators	1	30/04/2026		TLM1	CO3	T1,T2	
55.	Vector Identities	1	01/05/2026		TLM1	CO3	T1,T2	
56.	Vector Identities	1	05/05/2026		TLM1	CO3	T1,T2	
57.	TUTORIAL - 10	1	06/05/2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector 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
58.	Introduction to Unit-V	1	07/05/2026		TLM1	CO4	T1,T2	
59.	Line Integral	1	07/05/2026		TLM1	CO4	T1,T2	
60.	Circulation	1	08/05/2026		TLM1	CO4	T1,T2	
61.	TUTORIAL – 11	1	12/05/2026		TLM3	CO4	T1,T2	
62.	Work done	1	13/05/2026		TLM1	CO4	T1,T2	
63.	Surface Integral	1	14/05/2026		TLM1	CO4	T1,T2	
64.	Flux	1	14/05/2026		TLM1	CO4	T1,T2	
65.	Volume Integral	1	15/05/2026		TLM1	CO4	T1,T2	
66.	Green's Theorem	1	02/06/2026		TLM1	CO4	T1,T2	
67.	TUTORIAL – 12	1	03/06/2026		TLM3	CO4	T1,T2	
68.	Green's Theorem	1	04/06/2026		TLM1	CO4	T1,T2	
69.	Stoke's Theorem	1	04/06/2026		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	05/06/2026		TLM1	CO4	T1,T2	
71.	Divergence Theorem	1	09/06/2026		TLM1	CO4	T1,T2	
72.	Tutorial-12	1	10/06/2026		TLM3	CO4	T1,T2	
73.	Revision	1	11/06/2026					
No. of classes required to complete UNIT-V		16			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
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74.	Non-homogeneous Linear PDE with constant coefficients	2	11/06/2026 & 12/06/2026		TLM2	CO2	T1,T2	
No. of classes		2		No. of classes taken:				
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)								

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-CEVALUATION 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.

Ms.P.Kalma Begum	Dr. K.Jhansi 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 CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: J. RANGAIAH

Course Name & Code : Basic Civil and Mechanical Engineering & 23CM01

L-T-P Structure : 3-0-0

Credits: 3

Program/Sem/Sec : B.Tech., I-II-Sem., ECE-C

A.Y.: 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

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

CO1:	Describe various sub-divisions of Civil Engineering and to appreciate their role in societal development. (Understand)
CO2:	Outline the concepts of surveying and obtain the theoretical measurement of distances, angles and levels through surveying. (Understand)
CO3:	Classify the various materials used in construction and highway engineering and identify their appropriate usage as per the needs. (Understand)
CO4:	Illustrate the fundamental principles involved in transportation network system, their individual components and their engineering importance. (Understand)
CO5:	Explain the quality parameters of various water sources and functions of selected water storage and conveyance structures. (Understand)

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	-	-	-	2	-	2	-	-	-	-	-	2	-	2
CO2	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-
CO3	1	-	-	-	2	-	2	-	-	-	-	-	-	-	2
CO4	1	-	-	-	1	-	-	-	-	-	-	3	-	-	-
CO5	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-
	1 - Low				2 -Medium				3 - High						

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Basics of Civil Engineering**

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 CO's & PO's, Subject	1	02-02-2026		TLM2	
2.	Role of Civil Engineers in Society	1	03-02-2026		TLM2	
3.	Structural Eng., Geo-technical Eng.,- Transportation Eng.,	1	04-02-2026		TLM2	
4.	Hydraulics and Water Resources Eng., Environmental Eng.,	1	06-02-2026		TLM2	
5.	Building Construction and Planning-	1	09-02-2026		TLM2	
6.	Construction Materials-Cement -types	1	10-02-2026		TLM2	
7.	Aggregate types- Bricks- classifications	1	11-02-2026		TLM2	
8.	Steel-properties - types	1	13-02-2026		TLM2	
9.	Cement concrete- Applications	1	16-02-2026		TLM2	
10.	Introduction to Prefabricated construction Techniques, Over view- Prefabricated construction	1	17-02-2026		TLM2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: Surveying

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Objectives of Surveying, Horizontal Measurements	1	18-02-2026		TLM2	
12.	Angular Measurements, Compass survey	1	20-02-2026		TLM2	
13.	Introduction to Bearings,	1	23-02-2026		TLM2	
14.	Simple problems on bearings	1	24-02-2026		TLM2	
15.	Levelling introduction- Levelling instruments used for levelling	1	25-02-2026		TLM2	
16.	Practice problems	1	27-02-2026		TLM1	
17.	Practice problems	1	02-03-2026		TLM1	
18.	Practice problems	1	03-03-2026		TLM1	
19.	Contour mapping	1	06-03-2026		TLM1	
No. of classes required to complete UNIT-II: 9				No. of classes taken:		

UNIT-III: Transportation Engineering & Water Resources and Environmental Engineering

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
20.	Transportation Engineering Importance of Transportation in Nation's economic development	1	09-03-2026		TLM2	
21.	Types of Highway Pavements	1	10-03-2026		TLM2	
22.	Basics of Harbour, Tunnel	1	11-03-2026		TLM2	
23.	Basics of Airport, Railway Engineering	1	13-03-2026		TLM2	
24.	Water Resources and Environmental Engineering Introduction	1	16-03-2026		TLM2	
25.	Sources of water, Quality of water- Specifications Introduction to Hydrology	1	17-03-2026		TLM2	
26.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	18-03-2026		TLM2	
27.	Simple introduction to Dams and Reservoirs	1	20-03-2026		TLM2	
No. of classes required to complete UNIT-III: 8				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 & UNIT-III)	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III)	M1=15
I-Quiz Examination (Units-I, II & UNIT-III)	Q1=10
Assignment-II (Unit- IV, V & VI)	A2=5
II- Descriptive Examination (Unit- IV, V & VI)	M2=15
II-Quiz Examination (Unit- IV, V & VI)	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 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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyse and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Title	Course Instructor	Course Coordinator	Head of the Department
Signature			
Name of the Faculty	J.Rangaiah	B. Ramakrishna	Dr. K.V.Ramana



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 Phone: 08659-222933, Fax: 08659-222931

DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. K.Sri Lakshmi & Dr. D. Mallikharjuna Rao
Course Name & Code : Chemistry Lab&23FE52
L-T-P Structure : 0-0-3 **Credits:1.5**
Program/Sem/Sec : I B.Tech./II Sem/ECE-C **A.Y. :2025-26**

Pre requisites: Nil

Course Educational Objective:

- To enable the students to perform different types of volumetric titrations.
- It provides an overview of preparation of polymers, nanomaterials and analytical techniques.

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

CO1: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (**Analyze**)

CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. (**Apply**)

CO3: Measure the strength of acid present in Pb-Acid battery. (**Apply**)

CO4: Analyze important parameters of water to check its suitability for drinking purpose and industrial applications. (**Analyze**)

CO5: Improve individual / teamwork skills, communication and report writing skills with ethical values. (**Apply**)

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	1	2	-	-	-	-	-
CO2	3	-	1	-	-	2	1	-	-	-	-	-
CO3	3	2	1	-	-	-	2	-	-	-	-	-
CO4	3	1	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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 Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): ECE-C

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Chemistry lab, CO's, PO's	3	04-02-2026		TLM1	CO1	
2.	Explanation of chemicals and glassware	3	11-02-2026		TLM4	CO1	
3.	Preparation of a Bakelite	3	18-02-2026		TLM4	CO2	
4.	Measuring of pH of water sample	3	25-02-2026		TLM4	CO4	
5.	Determination of amount of HCl using standard Na ₂ CO ₃ solution	3	04-03-2026		TLM4	CO1	
6.	Determination of Strength of an acid in Pb-Acid battery	3	11-03-2026		TLM4	CO3	
7.	Estimation of total hardness of given water sample	3	18-03-2026		TLM4	CO1	
8.	Alkalinity of water sample	3	01-04-2026		TLM4	CO1	
9.	Estimation of Ferrous ion by permanganometry	3	08-04-2026		TLM4	CO4	
10.	Estimation of Ferrous ion by Dichrometry	3	15-04-2026		TLM4	CO4	
11.	Conductometric titration of strong acid <i>versus</i> strong base	3	22-04-2026		TLM4	CO1	
12.	Conductometric titration of weak acid <i>versus</i> strong base	3	29-04-2026		TLM4	CO1	
13.	Additional experiment/repeat	3	06-05-2026		TLM4	CO4	
14.	Additional experiment/repeat	3	13-05-2026		TLM4	CO1	
15.	Additional experiment/repeat	3	03-06-2025		TLM4	CO1	
16.	Internal	3	10-06-2026		TLM4	CO1	
Total		14					

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:

According to Academic Regulations of R20 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Evaluation Task	Marks
Day-to-Day Work	A1 = 10
Record & Observation	B1 = 5
Internal Exam	C1 = 15
Cumulative Internal Examination (CIE): (A1+B1+C1)	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.Y. Subbareddy	Dr.V.Parvathi	Dr.V.Parvathi	Dr.T.Satyanarayana
Signature				



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DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. D. Mallikharjuna Rao
Course Name & Code : Chemistry & 23FE02
L-T-P Structure : 3-0-0
Program/Sem/Sec : I-B.Tech./II-Sem/ECE-C
Credits: 03
A.Y. : 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions.
- To strengthen the basic concepts of bonding models, advanced engineering materials, electrochemistry, batteries and polymers.
- To introduce instrumental methods and their applications.

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

C01	Understand the fundamentals of quantum mechanics and molecular orbital energy diagrams for molecules. (Understand)
C02	Summarize the suitability of advanced materials like semiconductors, superconductors, super capacitors and nano materials, in advanced fields. (Understand)
C03	Apply Nernst equation in calculating cell potentials and understand conductometric, potentiometric titrations, electrochemical sensors and compare batteries for different applications. (Understand)
C04	Outline the importance of polymers and conducting polymers in advanced technologies. (Understand)
C05	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basic principles of chromatographic techniques. (Understand)

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

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
C01	3	-	-	-	-	-	-	-	-	-	-	1
C02	3	2	2	2	-	2	2	-	-	-	-	2
C03	3	3	2	2	-	2	2	-	-	-	-	2
C04	3	2	2	2	-	2	2	-	-	-	-	2
C05	3	2	1	1	-	-	-	-	-	-	-	1
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference: Books:

1. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
3. Textbook of Polymer Science, Fred W. Billmeyer, Jr, 3rd Edition

PART-B**COURSE DELIVERY PLAN (LESSON PLAN): ECE-C****UNIT-I: STRUCTURE AND BONDING MODELS**

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.	Bridge course	2	03-02-2026 & 04-02-2026			
2.	Introduction to chemistry course, CO's & PO's Fundamentals of Quantum Mechanics	1	06-02-2026		TLM1	
3.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	07-02-2026		TLM1	
4.	Particle In one dimensional box	1	10-02-2026		TLM1	
5.	Molecular Orbital Theory – Bonding in Homonuclear diatomic molecules-Energy level diagrams (N_2 , etc)	2	11-02-2026 & 13-02-2026		TLM1	
6.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams (CO, NO, etc.)	2	14-02-2026 & 17-02-2026		TLM1	
7.	Energy level diagrams-Summary	1	18-02-2026		TLM1	
8.	π -molecular orbitals of butadiene	1	20-02-2026		TLM1	
9.	π -molecular orbitals of benzene	1	21-02-2026		TLM1	
10.	Calculation of Bond order	1	24-02-2026		TLM1	
11.	Revision and assignment	1	25-02-2026		TLM1	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

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.	Semiconductors - Introduction	1	27-02-2026		TLM1	
2.	Semiconductors - Basic concept & applications	1	28-02-2026		TLM1	
3.	Super conductors - Introduction	1	04-03-2026		TLM1	
4.	Super conductors - Basic concept & applications	1	06-03-2026		TLM1	
5.	Super capacitors - Introduction, Basic concept	1	07-03-2026		TLM1	
6.	Super capacitors - classification & applications	1	10-03-2026		TLM1	
7.	Nano materials - Introduction	1	11-03-2026		TLM2	
8.	Nano materials - classification	1	13-03-2026		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	14-03-2026		TLM2	
10.	Nano materials - carbon nanotubes and graphene nanoparticles	2	17-03-2026 & 18-03-2026		TLM2	
11.	Revision and assignment	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 12				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

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.	Electrochemical cell, Nernst equation	1	31-03-2026		TLM1	
2.	Cell potential calculations and numerical problems	2	01-04-2026 & 04-04-2026		TLM1	
3.	Potentiometry- potentiometric titrations (redox titrations)	1	07-04-2026		TLM1	
4.	Concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations)	1	08-04-2026		TLM1	
5.	Electrochemical sensors – potentiometric sensors with examples,	1	10-04-2026		TLM1	

	amperometric sensors with examples					
6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries- working of the batteries including cell reactions	2	11-04-2026 & 15-04-2026		TLM1	
7.	Fuel cells, hydrogen-oxygen fuel cell– working of the cells	1	17-04-2026		TLM1	
8.	Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	18-04-2026		TLM1	
9.	Revision and assignment	2	21-04-2026 & 22-04-2026		TLM1	
No. of classes required to complete UNIT-III: 12				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

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 polymers, functionality of monomers	1	24-04-2026		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	25-04-2026		TLM1	
3.	Mechanisms of polymer formation	1	28-04-2026		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	29-04-2026		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	01-05-2026 & 02-05-2026		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	05-05-2026		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	06-05-2026		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	08-05-2026		TLM1	
9.	Revision and assignment	2	09-05-2026 & 12-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

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.	Electromagnetic spectrum	1	13-05-2026		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	15-05-2026		TLM1	
3.	UV-Visible Spectroscopy	1	16-05-2026		TLM1	
4.	Electronic transitions, Instrumentation	1	02-06-2026		TLM1	
5.	IR spectroscopies, fundamental modes	1	03-06-2026		TLM1	
6.	selection rules, Instrumentation	1	05-06-2026		TLM1	
7.	Chromatography-Basic Principle	1	06-06-2026		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	09-06-2026		TLM1	
9.	Revision and assignment	1	10-06-2026		TLM1	
No. of classes required to complete UNIT-V: 09				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

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.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	2	12-06-2026 & 13-06-2026		TLM1	

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.
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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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. D. Mallikharjuna Rao	Dr. V.Parvathi	Dr. V.Parvathi	Dr. T. Satyanarayana
Signature				

- R2. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition.
- R3. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
- R4. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakash an, 2021-22.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Si.No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
CYCLE-I						
1.	Introduction to Lab	3	05-02-2026		TLM4	
2.	Dove Tail Joint	3	12-02-2026		TLM4	
3.	Corner Lap Joint	3	19-02-2026		TLM4	
4.	T-Fitting	3	26-02-2026		TLM4	
5.	V-Fitting	3	05-03-2026		TLM4	
6.	Two Laps in Series and Parallel Connection with One Way Switch	3	12-03-2026		TLM4	
7.	Florescent Lamp and Calling Bell Circuit	3	02-04-2026		TLM4	
CYCLE-II						
8.	Preparation of Pipe Layout	3	09-04-2026		TLM4	
9.	Pipe Threading	3	16-04-2026		TLM4	
10.	Preparation of Rectangular Tray	3	23-04-2026		TLM4	
11.	Preparation of Open Scoop	3	30-04-2026		TLM4	
12.	Preparation Of S-Hook	3	07-05-2026		TLM4	
13.	Preparation of chisel,	3	14-05-2026		TLM4	
14.	Internal Lab Exam	3	04-06-2026		-----	
No. of classes required to complete				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	Expt. no's	Marks
Day to Day work = A	1,2,3,4,5,6,7,8...	A=10
Record/ Viva = B	1,2,3,4,5,6,7,8	B=05
Internal Test = C	1,2,3,4,5,6,7,8	C = 15
Cumulative Internal Examination: A+B+C = 30	1,2,3,4,5,6,7,8	30
Semester End Examinations = D	1,2,3,4,5,6,7,8	70
Total Marks: A+ B + C + D = 100	1,2,3,4,5,6,7,8	100

PART-D**PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):**

PEO 1	To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO 2	To Function professionally in the rapidly changing world with advances in technology.
PEO 3	To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO 4	To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner.

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
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
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
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	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
PSO 3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Course Instructor

**Head of the
Department**

Signature

**Name of
the Faculty**

Mr. B NARASIMHA RAO

Dr. K V RAMANA



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Approved by AICTE, New Delhi & Permanently Affiliated to JNTUK, Kakinada
Accredited by NAAC with "A" Grade and NBA (ECE, EEE, CSE, IT, MECH, CE & ASE) Under Tier-I
L B Reddy Nagar, Mylavaram-521 230, NTR District, Andhra Pradesh.

Department of Electronics & Communication Engineering

COURSE HANDOUT

PART-A

Name of Course Instructor : M.Sambasiva Reddy
Course Name & Code : Network Analysis - 23EC01
L-T-P-Cr Structure : 3-0-0-3
Program/Sem/Sec : B.Tech., ECE., II-Sem., Section- D A.Y : 2025-26

Course Objectives:

- To introduce basic laws, mesh & nodal analysis techniques for solving electrical circuits.
- To impart knowledge on applying appropriate theorem for electrical circuit analysis.
- To explain transient behavior of circuits in time and frequency domains.
- To teach concepts of resonance.
- To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

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

CO1	Apply fundamental laws and theorems to compute electrical variables of DC circuits (Apply)
CO2	Analyze electrical networks during transients in the Laplace domain (Apply)
CO3	Apply fundamental laws and theorems to compute electrical variables of AC electrical circuits (Apply)
CO4	Analyse resonance circuits (Analyse)
CO5	Evaluate variables associated with magnetic circuits (Apply)
CO6	Compute the parameters of a two-port network (Apply)

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	PSO 1	PSO 2	PSO 3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO5	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO6	3	3	1	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).

TEXT BOOK(S):

- T1 Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
T2 Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9 Edition 2020.
T3 Network lines and Fields by John. D. Ryder 2nd Edition, PHI

REFERENCE BOOK(S):

- R1** D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
R2 Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
R3 Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN) - Section-C****UNIT-I:**

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and COs	1	02-02-26			
2.	Introduction to Unit-I	1	02-02-26			
3.	Types of circuit components	1	06-02-26			
4.	Types of Sources and Source Transformations	1	07-02-26			
5.	Mesh analysis and Nodal analysis	1	09-02-26			
6.	Problem Solving with resistances including dependent sources also	1	09-02-26			
7.	Principal of Duality with examples	1	13-02-26			
8.	Thevenin's Theorem	1	14-02-26			
9.	Norton's Theorem	1	16-02-26			
10.	Milliman's Theorem	1	16-02-26			
11.	Reciprocity Theorem	1	20-02-26			
12.	Compensation, Substitution Theorems	1	21-02-26			
13.	Superposition Theorem	1	23-02-26			
14.	Max Power Transfer Theorem	1	23-02-26			
15.	Tellegens Theorem	1	27-02-26			
16.	Problem solving using Dependent sources also	1	28-02-26			
No. of classes required to complete UNIT-I		16	No. of classes taken			

UNIT-II: Transients & Laplace transform

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	First order differential equations Definition of time constants	1	02-03-26			
18.	R-L circuit with DC excitation RC circuit with DC excitation	1	02-03-26			
19.	evaluating initial conditions procedure Second order differential equations	1	06-03-26			
20.	homogeneous, non-homogenous DEs	1	07-03-26			
21.	Problem-solving using R-L-C elements with DC excitation and AC excitation	1	09-03-26			
22.	Response as related to s-plane rotation of roots	1	09-03-26			
23.	Laplace transform: introduction Laplace transformation, basic theorems	1	13-03-26			

24.	Problem solving using Laplace transform	1	14-03-26			
25.	Partial fraction expansion	1	16-03-26			
26.	Heaviside's expansions	1	16-03-26			
27.	Problem solving using Laplace transform	1	20-03-26			
No. of classes required to complete UNIT-II		11	No. of classes taken			

UNIT-III : Steady State Analysis of A.C Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Impedance concept, phase angle	1	30-03-24			
29.	series R-L, R-C, R-LC circuits problem solving	1	30-03-24			
30.	Complex impedance and phasor notation for R-L, R-C, R-L-C	1	04-04-24			
31.	problem solving using mesh and nodal analysis	1	06-04-24			
32.	Star-Delta conversion	1	06-04-24			
33.	Problem solving using Laplace transforms	1	10-04-24			
34.	Problem solving	1	11-04-24			
35.	Problem solving	1	13-04-24			
36.	Problem solving	1	13-04-24			
37.	Problem solving	1	17-04-24			
No. of classes required to complete UNIT-III.		10	No. of classes taken			

UNIT-IV: Resonance & Coupled Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction, Definition of Q	1	18-04-26			
39.	Series resonance, Bandwidth of series resonance	1	20-04-26			
40.	Parallel resonance	1	20-04-26			
41.	General case-resistance present in both branches	1	24-04-26			
42.	Anti-resonance at all frequencies	1	25-04-26			
43.	Coupled Circuits: Self-inductance	1	27-04-26			
44.	Mutual inductance, Coefficient of coupling	1	27-04-26			
45.	Analysis of coupled circuits	1	01-05-26			
46.	Natural current, Dot rule of coupled circuits	1	02-05-26			
47.	conductively coupled equivalent circuits- problem solving	1	04-05-26			
48.	Problem Solving	1	04-05-26			
49.	Problem Solving	1	08-05-26			
No. of classes required to complete UNIT-IV		12	No. of classes taken			

UNIT-V: Two-port Network

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
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50.	Relationship of two port networks Z-parameters, Y-parameters	1	09-05-26			
51.	Transmission line parameters, h-parameters	1	11-05-26			
52.	Relationships Between parameter Sets	1	15-05-26			
53.	Parallel & series connection of two port networks	1	16-05-26			
54.	Cascading of two port networks	1	01-06-26			
55.	problem solving using dependent sources also	1	01-06-26			
56.	Image and iterative impedances Image and iterative transfer constants	1	05-06-26			
57.	Insertion loss, Attenuators and pads.	1	06-06-26			
58.	Lattice network and its parameters	1	08-06-26			
59.	Impedance matching networks	1	08-06-26			
60.	Problem Solving	1	12-06-26			
No. of classes required to complete UNIT-V		11	No. of classes taken			

Contents beyond the Syllabus

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
61.	Filters	1	13-06-26			
62.	Attenuators	1	13-06-26			

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:

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
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	30
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	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 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: Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
- PSO 2: VLSI and Embedded Systems:** 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: Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Date: 31-01-2026

Course Instructor
M.Sambasiva Reddy

Course Coordinator
Dr.K.Ravi Kumar

Module Coordinator
Dr.B.V.N.R Siva Kumar

HOD
Dr.G.Srinivasulu



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DIVISION OF CHEMISTRY

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Y. Subbareddy

Course Name & Code : Chemistry & 23FE02

L-T-P Structure : 3-0-0

Program/Sem/Sec : I B.Tech./II Sem/ECE-D

Credits: 03

A.Y. :2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enable the students to understand the fundamental concepts of chemistry and to provide them with the knowledge of industrial problems and finding the solutions.
- To strengthen the basic concepts of bonding models, advanced engineering materials, electrochemistry, batteries and polymers.
- To introduce instrumental methods and their applications.

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

CO1	Understand the fundamentals of quantum mechanics and molecular orbital energy diagrams for molecules. (Understand)
CO2	Summarize the suitability of advanced materials like semiconductors, superconductors, super capacitors and nano materials, in advanced fields. (Understand)
CO3	Apply Nernst equation in calculating cell potentials and understand conductometric, potentiometric titrations, electrochemical sensors and compare batteries for different applications. (Understand)
CO4	Outline the importance of polymers and conducting polymers in advanced technologies. (Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basic principles of chromatographic techniques. (Understand)

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

POs COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	-	-	-	-	-	-	-	-	-	-	1
CO2	3	2	2	2	-	2	2	-	-	-	-	2
CO3	3	3	2	2	-	2	2	-	-	-	-	2
CO4	3	2	2	2	-	2	2	-	-	-	-	2
CO5	3	2	1	1	-	-	-	-	-	-	-	1
<p>1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)</p>												

Textbooks:

1. Jain and Jain, Engineering Chemistry, 16/e, Dhanpat Rai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference: Books:

1. Skoog and West, Principles of Instrumental Analysis, 6/e, Thomson, 2007.
2. J.D. Lee, Concise Inorganic Chemistry, 5th Edition, Wiley Publications, Feb.2008
3. Textbook of Polymer Science, Fred W. Billmeyer, Jr, 3rd Edition

PART-B**COURSE DELIVERY PLAN (LESSON PLAN): ECE-D****UNIT-I: STRUCTURE AND BONDING MODELS**

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 chemistry course, CO's & PO's & Bridge Course	1	02-02-2026		TLM1	
2.	Fundamentals of Quantum Mechanics	1	04-02-2026		TLM1	
3.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	05-02-2026		TLM1	
4.	Particle in one-dimensional box	1	06-02-2026		TLM1	
5.	Molecular Orbital Theory	1	09-02-2026		TLM1	
6.	Bonding in Homonuclear diatomic molecules- Energy level diagrams (N_2 , etc)	1	11-02-2026		TLM1	
7.	Molecular Orbital Theory - Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams (CO, NO, etc.)	2	12-02-2026 & 13-02-2026		TLM1	
8.	Energy level diagrams-Summary	1	16-02-2026		TLM1	
9.	π -molecular orbitals of butadiene	1	18-02-2026		TLM1	
10.	π -molecular orbitals of benzene	1	19-02-2026		TLM1	
11.	Calculation of Bond order	1	20-02-2026		TLM1	
12.	Revision and assignment	1	23-02-2026		TLM1	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

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.	Semiconductors - Introduction	1	25-02-2026		TLM1	
2.	Semiconductors - Basic concept & applications	1	26-02-2026		TLM1	
3.	Super conductors - Introduction	1	27-02-2026		TLM1	
4.	Super conductors - Basic concept & applications	1	02-03-2026		TLM1	
5.	Super capacitors - Introduction, Basic concept	1	04-03-2026		TLM1	
6.	Super capacitors - classification & applications	2	05-03-2026 & 06-03-2026		TLM1	
7.	Nano materials – Introduction	1	9-03-2026		TLM2	
8.	Nano materials – classification	1	11-03-2026		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	12-03-2026		TLM2	
10.	Nano materials - carbon nanotubes and graphene nanoparticles	2	13-03-2026 & 16-03-2026		TLM2	
11.	Revision and assignment	2	18-03-2026 & 20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 14				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

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.	Electrochemical cell, Nernst equation	1	30-03-2026		TLM1	
2.	Cell potential calculations and numerical problems	2	01-04-2026 & 02-04-2026		TLM1	
3.	Potentiometry- potentiometric titrations (redox titrations)	1	06-04-2026		TLM1	
4.	Concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations)	1	08-04-2026		TLM1	
5.	Electrochemical sensors – potentiometric sensors	1	09-04-2026		TLM1	

	with examples, amperometric sensors with examples					
6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries- working of the batteries including cell reactions	2	10-04-2026 & 13-04-2026		TLM1	
7.	Fuel cells, hydrogen-oxygen fuel cell- working of the cells	1	15-04-2026		TLM1	
8.	Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	16-04-2026		TLM1	
9.	Revision and assignment	2	17-04-2026 & 20-04-2026		TLM1	
No. of classes required to complete UNIT-III: 12				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

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 polymers, functionality of monomers	1	22-04-2026		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	23-04-2026		TLM1	
3.	Mechanisms of polymer formation	1	24-04-2026		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	27-04-2026		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	29-04-2026 & 30-04-2026		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	01-05-2026		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	04-05-2026		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	06-05-2026		TLM1	
9.	Revision and assignment	2	07-05-2026 & 08-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

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.	Electromagnetic spectrum	1	11-05-2026		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	13-05-2026		TLM1	
3.	UV-Visible Spectroscopy	1	14-05-2026		TLM1	
4.	electronic transition, Instrumentation	1	15-06-2026		TLM1	
5.	IR spectroscopy, fundamental modes	1	01-06-2026		TLM1	
6.	selection rules, Instrumentation	1	03-06-2026		TLM1	
7.	Chromatography-Basic Principle	1	04-06-2025		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	2	05-06-2026 & 08-06-2026		TLM1	
9.	Revision and assignment	1	10-06-2026		TLM1	
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

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.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	2	11-06-2026 & 12-06-2026		TLM1	

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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Y. Subbareddy	Dr. V.Parvathi	Dr. V.Parvathi	Dr. T.Satyanarayana
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

Accredited by NAAC with "A" Grade & NBA for ASE, CE, CSE, ECE, EEE, ME & IT (Under Tier - I)

An ISO 21001:2018, 14001:2015, 50001:2018 Certified Institution

Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada

L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.

Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	: I B. Tech., II-Sem., ECE D
ACADEMIC YEAR	: 2025-26
COURSE NAME & CODE	: Differential Equations & Vector Calculus
L-T-P STRUCTURE	: 3-0-0
COURSE CREDITS	: 3
COURSE INSTRUCTOR	: Ms. K. N. V. Lakshmi
COURSE COORDINATOR	: Dr. K. Jhansi Rani
PRE-REQUISITES	: Basics of Vectors, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To enlighten the learners in the concept of differential equations and multivariable calculus
- 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)

After completion of the course, the student will be able to

CO1: Solve the differential equations related to various engineering fields – L3

CO2: Apply knowledge of partial differentiation in modeling and solving of Partial differential equations – L3

CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence – L3

CO4: Evaluate the work done against a field, circulation and flux using Vector Calculus – L3

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

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	3	-	-	-	-	-	-	-	-	-	1
CO2	3	1	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	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, New Delhi, 2017.

T2 Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "Thomas Calculus", 14th Edition, Pearson Publishers, 2018.

R2 Dennis G. Zill and Warren S. Jones and Bartlett, "Advanced Engineering Mathematics", 2018.

R3 Glyn James, "Advanced Modern Engineering Mathematics", 5th Edition, Pearson Publishers, 2018.

R4 R.K. Jain and S.R.K. Iyengar, “Advanced Engineering Mathematics”, 5th Edition (9th reprint), Alpha Science International Ltd., 2021.

R5 B. V. Ramana, “Higher Engineering Mathematics”, 3rd Edition McGraw Hill Education, 2017.

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	02/02/2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	03/02/2026		TLM2			

UNIT-I: Differential Equations of first order and first degree

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.	Introduction to UNIT I	1	05/02/2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	05/02/2026		TLM1	CO1	T1,T2	
5.	Bernoulli’s DE	1	06/02/2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	09/02/2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	10/02/2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	12/02/2026		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	12/02/2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type II	1	13/02/2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	16/02/2026		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	17/02/2026		TLM3	CO1	T1,T2	
13.	Newton’s Law of cooling	1	19/02/2026		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	19/02/2026		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	20/02/2026		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	23/02/2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

UNIT-II: Linear Differential equations of higher order (Constant Coefficients)

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	24/02/2026		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	26/02/2026		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	26/02/2026		TLM1	CO1	T1,T2	
20.	P.I for Cos bx, or sin bx	1	27/02/2026		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	02/03/2026		TLM1	CO1	T1,T2	
22.	TUTORIAL - 3	1	05/03/2026		TLM3	CO1	T1,T2	
23.	P.I for $e^{ax+b}v(x)$	1	05/03/2026		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	06/03/2026		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	09/03/2026		TLM1	CO1	T1,T2	

26.	Method of Variation of parameters	1	10/03/2026		TLM1	CO1	T1,T2	
27.	TUTORIAL - 4	1	12/03/2026		TLM3	CO1	T1,T2	
28.	Simultaneous linear equations	1	12/03/2026		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	13/03/2026		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	16/03/2026		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	17/03/2026		TLM1	CO1	T1,T2	
32.	Revision	1	20/03/2026					
No. of classes required to complete UNIT-2		16			No. of classes taken:			

I MID EXAMINATIONS (23-03-2026 TO 28-03-2026)

UNIT-III: Partial Differential Equations

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
33.	Introduction to Unit III	1	30/03/2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	31/03/2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	02/04/2026		TLM1	CO2	T1,T2	
36.	TUTORIAL - 5	1	02/04/2026		TLM3	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	06/04/2026		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	07/04/2026		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	09/04/2026		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	09/04/2026		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	10/04/2026		TLM1	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	13/04/2026		TLM1	CO2	T1,T2	
43.	TUTORIAL - 6	1	16/04/2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-3		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

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
44.	Introduction to UNIT IV	1	16/04/2026		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	17/04/2026		TLM1	CO3	T1,T2	
46.	Gradient	1	20/04/2026		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	21/04/2026		TLM1	CO3	T1,T2	
48.	Divergence	1	23/04/2026		TLM1	CO3	T1,T2	
49.	TUTORIAL - 7	1	23/04/2026		TLM3	CO3	T1,T2	

50.	Curl	1	24/04/2026		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	27/04/2026		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	28/04/2026		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	30/04/2026		TLM1	CO3	T1,T2	
54.	TUTORIAL - 8	1	30/04/2026		TLM3	CO3	T1,T2	
55.	Vector Identities	1	01/05/2026		TLM1	CO3	T1,T2	
56.	Vector Identities	1	04/05/2026		TLM1	CO3	T1,T2	
57.	Vector Identities	1	05/05/2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-4		14			No. of classes taken:			

UNIT-V: Vector 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
58.	Introduction to Unit-V	1	07/05/2026		TLM1	CO4	T1,T2	
59.	Line Integral	1	07/05/2026		TLM1	CO4	T1,T2	
60.	Circulation	1	08/05/2026		TLM1	CO4	T1,T2	
61.	Work done	1	11/05/2026		TLM1	CO4	T1,T2	
62.	Surface Integral, Flux	1	12/05/2026		TLM1	CO4	T1,T2	
63.	Volume Integral	1	14/05/2026		TLM1	CO4	T1,T2	
64.	TUTORIAL - 9	1	14/05/2026		TLM3	CO4	T1,T2	
65.	Green's Theorem	1	15/05/2026		TLM1	CO4	T1,T2	
66.	Green's Theorem	1	01/06/2026		TLM1	CO4	T1,T2	
67.	Stoke's Theorem	1	02/06/2026		TLM1	CO4	T1,T2	
68.	Stoke's Theorem	1	04/06/2026		TLM1	CO4	T1,T2	
69.	Divergence Theorem	1	04/06/2026		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	05/06/2026		TLM1	CO4	T1,T2	
71.	TUTORIAL - 10	1	08/06/2026		TLM3	CO4	T1,T2	
72.	Revision	1	09/06/2026					
73.	Revision	1	11/06/2026					
No. of classes required to complete UNIT-5		14			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
74.	Non-homogeneous Linear PDE with constant coefficients	2	11/06/2026 & 12/06/2026		TLM2			
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)								

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-CEVALUATION 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.
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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 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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PO 9	Individual and team work: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
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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.

Ms. K. N. V. Lakshmi	Dr. K. Jhansi Rani	Dr. A. Rami Reddy	Dr. T. Satyanarayana
Course Instructor	Course Coordinator	Module Coordinator	HOD



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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr C Rajamallu

Course Name & Code : Basic Civil and Mechanical Engineering & 23CM01

L-T-P Structure : 3-0-0

Credits: 3

Program/Sem/Sec : B.Tech., I-II-Sem. ECE-D section

A.Y.: 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

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

CO1:	Describe various sub-divisions of Civil Engineering and to appreciate their role in societal development. (Understand)
CO2:	Outline the concepts of surveying and obtain the theoretical measurement of distances, angles and levels through surveying. (Understand)
CO3:	Classify the various materials used in construction and highway engineering and identify their appropriate usage as per the needs. (Understand)
CO4:	Illustrate the fundamental principles involved in transportation network system, their individual components and their engineering importance. (Understand)
CO5:	Explain the quality parameters of various water sources and functions of selected water storage and conveyance structures. (Understand)

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	-	-	-	2	-	2	-	-	-	-	-	2	-	2
CO2	-	-	-	-	2	-	2	-	-	-	-	-	-	-	-
CO3	1	-	-	-	2	-	2	-	-	-	-	-	-	-	2
CO4	1	-	-	-	1	-	-	-	-	-	-	3	-	-	-
CO5	-	-	-	-	1	-	-	-	-	1	-	-	-	-	-
	1 - Low				2 -Medium				3 - High						

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Basics of Civil Engineering**

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 CO's & PO's, Subject	1	02-02-2026		TLM2	
2.	Basics of Civil Engineering: Role of Civil Engineers in Society	1	03-02-2026		TLM2	
3.	Various Disciplines of Civil Engineering- Structural Engineering-	1	09-02-2026		TLM2	
4.	Geo-technical Engineering- Transportation Engineering	1	10-02-2026		TLM2	
5.	Hydraulics and Water Resources Engineering	1	11-02-2026		TLM2	
6.	Environmental Engineering-Scope of each discipline - Building Construction and Planning-	1	14-02-2026		TLM2	
7.	Construction Materials-Cement -types	1	16-02-2026		TLM2	
8.	Aggregate types- Bricks- classifications	1	17-02-2026		TLM2	
9.	Steel-properties - types Cement concrete- Applications	1	18-02-2026		TLM2	
10.	Introduction to Prefabricated construction Techniques, Over view- Prefabricated construction	1	21-02-2026		TLM2	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: Surveying

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.	Objectives of Surveying, Horizontal Measurements	1	23-02-2026		TLM2	
2.	Angular Measurements, Compass survey	1	24-02-2026		TLM2	
3.	Introduction to Bearings,	1	25-02-2026		TLM2	
4.	Simple problems on bearings	1	28-02-2026		TLM2	
5.	Levelling introduction-	1	02-03-2026		TLM2	
6.	Practice problems	1	02-03-2026		TLM2	
7.	Levelling instruments used for levelling	1	03-03-2026		TLM1	
8.	Practice problems	1	07-03-2026		TLM1	
9.	Practice problems	1	07-03-2026		TLM2	
10.	Contour mapping	1	09-03-2026		TLM2	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-III: Transportation Engineering & Water Resources and Environmental Engineering

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.	Transportation Engineering Importance of Transportation in Nation's economic development	1	10-03-2026		TLM2	
2.	Types of Highway Pavements	1	11-03-2026		TLM2	
3.	Basics of Harbour, Tunnel	1	14-03-2026		TLM2	
4.	Basics of Airport, Railway Engineering	1	14-03-2026		TLM2	
5.	Water Resources and Environmental Engineering Introduction	1	16-03-2026		TLM2	
6.	Sources of water, Quality of water-Specifications	1	16-03-2026		TLM2	
7.	Introduction to Hydrology	1	17-03-2026		TLM2	
8.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	17-03-2026		TLM2	
9.	Simple introduction to Dams and Reservoirs	1	18-03-2026		TLM2	
10.	Revision	2	18-03-2026		TLM2	
No. of classes required to complete UNIT-III: 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 (R23 Regulation):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyse and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Title	Course Instructor	Course Coordinator	Head of the Department
Name of the Faculty	Dr C Rajamallu	B. Ramakrishna	Dr. K.V.Ramana
Signature			



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. Amanatulla Mohammad
Course Name & Code : Introduction to Programming (23CS01)
L-T-P Structure : 4-1-0 Credits: 3
Program/Sem/Sec : B.Tech. -ECE/II/D-Sec. A.Y.: 2025-26

PRE-REQUISITE: Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO):

- To introduce students to the fundamentals of computer programming.
- To provide hands-on experience with coding and debugging.
- To foster logical thinking and problem-solving skills using programming.
- To familiarize students with programming concepts such as data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, concept of algorithms and flowcharts.	Understand – Level 2
CO2:	Understand the features of C language.	Analyze – Level 4
CO3:	Interpret the problem and develop an algorithm to solve it.	Apply – Level 3
CO4:	Implement various algorithms using the C programming language.	Understand – Level 2
CO5:	Develop skills required for problem-solving and optimize the code.	Apply – Level 3

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	2	-	-	-	-	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
CO5	3	2	2	-	-	-	-	-	-	-	-	-	-	-	-
			1 – Low					2 – Medium					3 – High		

TEXTBOOKS:

T1:	"The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988 edition, 2015
T2:	Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

R1:	Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.
R2:	Programming in C, Reema Thareja, Oxford, 2016, 2nd edition
R3:	C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Programming and Problem Solving

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.	Discussion of CEO's and CO's	1	02-02-2026			
2.	History of Computers	1	03-02-2026			
3.	Basic organization of a computer: ALU, input-output units.	1	05-02-2026			
4.	Memory, program counter	1	07-02-2026			
5.	Introduction to Programming Languages,	1	09-02-2026			
6.	Basics of a Computer Program- Algorithms	1	10-02-2026			
7.	Flowcharts (Using Dia Tool), pseudo code.	1	12-02-2026			
8.	Introduction to Compilation and Execution	1	14-02-2026			
9.	Primitive Data Types	2	16-02-2026 17-02-2026			
10.	Variables, and Constants, Basic Input and Output operations	1	19-02-2026			
11.	Type Conversion, and Casting	1	21-02-2026			
12.	Problem solving techniques: Algorithmic approach, characteristics of algorithm	1	23-02-2026			
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	24-02-2026			
14.	Time and space complexities of algorithms.	1	26-02-2026			
No. of classes required to complete UNIT – I: 15				No. of classes taken:		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Simple sequential programs Conditional Statements	1	28-02-2026			
16.	if, if-else, else if ladder	1	02-03-2026			
17.	Switch cases	1	05-03-2026			
18.	Example programs on Decision Making and Branching	2	07-03-2026 09-03-2026			
19.	Loops: while, Example programs	1	10-03-2026			
20.	do-while, for, Example programs on Loops	1	12-03-2026			
21.	Break and continue	1	14-03-2026			
22.	Example programs on Loops	1	16-03-2026			
23.	Revision	1	17-03-2026			
No. of classes required to complete UNIT – II: 10				No. of classes taken:		

UNIT – III: Arrays and Strings

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.	Arrays Introduction, Declaration	1	30-03-2026				
25.	Array indexing, Accessing elements	1	31-03-2026				
26.	memory model	1	02-04-2026				
27.	programs with array of integers	1	04-04-2026				
28.	Introduction to two dimensional arrays	1	06-04-2026				
29.	2D Array indexing, Accessing elements	1	07-04-2026				
30.	programs with 2D arrays	1	09-04-2026				
31.	Introduction to Strings	1	11-04-2026				
32.	Reading and Writing Operations on Strings	1	13-04-2026				
33.	String Handling Functions	1	14-04-2026				
34.	Example Programs using Strings	1	16-04-2026				
No. of classes required to complete UNIT – III: 11				No. of classes taken:			

UNIT – IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly	
35.	Introduction to Pointers	1	18-04-2026				
36.	dereferencing and address operators	1	20-04-2026				
37.	pointer and address arithmetic	1	21-04-2026				
38.	array manipulation using pointers	2	23-04-2026				
39.			25-04-2026				
	User-defined data types	1	27-04-2026				
40.	Structures , Definition and Initialization	2	28-04-2026 30-04-2026				
41.	Example programs	1	02-05-2026				
42.	Unions	2	04-05-2026 05-05-2026				
43.	Example programs	1	07-05-2026				
44.	Revision	1	09-05-2026				
No. of classes required to complete UNIT – IV: 13				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
45.	Introduction to Functions	1	11-05-2026			
46.	Function Declaration and Definition	1	12-05-2026			
47.	Function call Return Types	1	14-05-2026			
48.	Arguments	1	16-05-2026			
49.	modifying parameters inside functions using pointers	1	01-06-2026			
50.	arrays as parameters	1	02-06-2026			
51.	Scope and Lifetime of Variables	1	04-06-2026			
52.	Introduction to Files	1	06-06-2026			

53.	Basics of File Handling	1	08-06-2026			
54.	Operations on Files	1	09-06-2026			
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	HOD Sign Weekly
55.	Application Development using C	1	11-06-2026			
56.	Introduction to Data Structures	1	13-06-2026			

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):

PO1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	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.
PO3	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.
PO4	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.

P05	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
P06	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
P07	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.
P08	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
P09	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
P010	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.
P011	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.
P012	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):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO2	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.	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	HOD
Name of the Faculty	Mr. Md. Amanatulla	Dr. B. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				



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L B Reddy Nagar, Mylavaram-521 230, NTR District, Andhra Pradesh.

Department of Electronics & Communication Engineering

COURSE HANDOUT

PART-A

Name of Course Instructor : M.Sambasiva Reddy
Course Name & Code : Network Analysis - 23EC01
L-T-P-Cr Structure : 3-0-0-3
Program/Sem/Sec : B.Tech., ECE., II-Sem., Section- D A.Y : 2025-26

Course Objectives:

- To introduce basic laws, mesh & nodal analysis techniques for solving electrical circuits.
- To impart knowledge on applying appropriate theorem for electrical circuit analysis.
- To explain transient behavior of circuits in time and frequency domains.
- To teach concepts of resonance.
- To introduce open circuit, short circuit, transmission, hybrid parameters and their interrelationship.

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

CO1	Apply fundamental laws and theorems to compute electrical variables of DC circuits (Apply)
CO2	Analyze electrical networks during transients in the Laplace domain (Apply)
CO3	Apply fundamental laws and theorems to compute electrical variables of AC electrical circuits (Apply)
CO4	Analyse resonance circuits (Analyse)
CO5	Evaluate variables associated with magnetic circuits (Apply)
CO6	Compute the parameters of a two-port network (Apply)

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	PSO 1	PSO 2	PSO 3
CO1	3	3	-	-	-	-	-	-	-	-	-	-	-	1	-
CO2	3	3	2	-	-	-	-	-	-	-	-	-	-	1	-
CO3	3	3	-	-	-	-	-	-	-	-	-	-	-	2	-
CO4	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO5	3	2	1	-	-	-	-	-	-	-	-	-	-	2	-
CO6	3	3	1	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).

TEXT BOOK(S):

- T1 Network Analysis – ME Van Valkenburg, Prentice Hall of India, revised 3rd Edition, 2019.
T2 Engineering Circuit Analysis by William H. Hayt, Jack Kemmerly, Jamie Phillips, Steven M. Durbin, 9 Edition 2020.
T3 Network lines and Fields by John. D. Ryder 2nd Edition, PHI

REFERENCE BOOK(S):

- R1** D. Roy Choudhury, Networks and Systems, New Age International Publications, 2013.
R2 Joseph Edminister and Mahmood Nahvi, Electric Circuits, Schaum's Outline Series, 7th Edition, Tata McGraw Hill Publishing Company, New Delhi, 2017
R3 Fundamentals of Electric Circuits by Charles K. Alexander and Matthew N. O. Sadiku, McGraw-Hill Education.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN) - Section-C****UNIT-I:**

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and COs	1	02-02-26			
2.	Introduction to Unit-I	1	02-02-26			
3.	Types of circuit components	1	06-02-26			
4.	Types of Sources and Source Transformations	1	07-02-26			
5.	Mesh analysis and Nodal analysis	1	09-02-26			
6.	Problem Solving with resistances including dependent sources also	1	09-02-26			
7.	Principal of Duality with examples	1	13-02-26			
8.	Thevenin's Theorem	1	14-02-26			
9.	Norton's Theorem	1	16-02-26			
10.	Milliman's Theorem	1	16-02-26			
11.	Reciprocity Theorem	1	20-02-26			
12.	Compensation, Substitution Theorems	1	21-02-26			
13.	Superposition Theorem	1	23-02-26			
14.	Max Power Transfer Theorem	1	23-02-26			
15.	Tellegens Theorem	1	27-02-26			
16.	Problem solving using Dependent sources also	1	28-02-26			
No. of classes required to complete UNIT-I		16	No. of classes taken			

UNIT-II: Transients & Laplace transform

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	First order differential equations Definition of time constants	1	02-03-26			
18.	R-L circuit with DC excitation RC circuit with DC excitation	1	02-03-26			
19.	evaluating initial conditions procedure Second order differential equations	1	06-03-26			
20.	homogeneous, non-homogenous DEs	1	07-03-26			
21.	Problem-solving using R-L-C elements with DC excitation and AC excitation	1	09-03-26			
22.	Response as related to s-plane rotation of roots	1	09-03-26			
23.	Laplace transform: introduction Laplace transformation, basic theorems	1	13-03-26			

24.	Problem solving using Laplace transform	1	14-03-26			
25.	Partial fraction expansion	1	16-03-26			
26.	Heaviside's expansions	1	16-03-26			
27.	Problem solving using Laplace transform	1	20-03-26			
No. of classes required to complete UNIT-II		11	No. of classes taken			

UNIT-III : Steady State Analysis of A.C Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Impedance concept, phase angle	1	30-03-24			
29.	series R-L, R-C, R-LC circuits problem solving	1	30-03-24			
30.	Complex impedance and phasor notation for R-L, R-C, R-L-C	1	04-04-24			
31.	problem solving using mesh and nodal analysis	1	06-04-24			
32.	Star-Delta conversion	1	06-04-24			
33.	Problem solving using Laplace transforms	1	10-04-24			
34.	Problem solving	1	11-04-24			
35.	Problem solving	1	13-04-24			
36.	Problem solving	1	13-04-24			
37.	Problem solving	1	17-04-24			
No. of classes required to complete UNIT-III.		10	No. of classes taken			

UNIT-IV: Resonance & Coupled Circuits

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction, Definition of Q	1	18-04-26			
39.	Series resonance, Bandwidth of series resonance	1	20-04-26			
40.	Parallel resonance	1	20-04-26			
41.	General case-resistance present in both branches	1	24-04-26			
42.	Anti-resonance at all frequencies	1	25-04-26			
43.	Coupled Circuits: Self-inductance	1	27-04-26			
44.	Mutual inductance, Coefficient of coupling	1	27-04-26			
45.	Analysis of coupled circuits	1	01-05-26			
46.	Natural current, Dot rule of coupled circuits	1	02-05-26			
47.	conductively coupled equivalent circuits-problem solving	1	04-05-26			
48.	Problem Solving	1	04-05-26			
49.	Problem Solving	1	08-05-26			
No. of classes required to complete UNIT-IV		12	No. of classes taken			

UNIT-V: Two-port Network

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
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50.	Relationship of two port networks Z-parameters, Y-parameters	1	09-05-26			
51.	Transmission line parameters, h-parameters	1	11-05-26			
52.	Relationships Between parameter Sets	1	15-05-26			
53.	Parallel & series connection of two port networks	1	16-05-26			
54.	Cascading of two port networks	1	01-06-26			
55.	problem solving using dependent sources also	1	01-06-26			
56.	Image and iterative impedances Image and iterative transfer constants	1	05-06-26			
57.	Insertion loss, Attenuators and pads.	1	06-06-26			
58.	Lattice network and its parameters	1	08-06-26			
59.	Impedance matching networks	1	08-06-26			
60.	Problem Solving	1	12-06-26			
No. of classes required to complete UNIT-V		11	No. of classes taken			

Contents beyond the Syllabus

S.No.	Topic/s	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
61.	Filters	1	13-06-26			
62.	Attenuators	1	13-06-26			

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:

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
Cumulative Internal Examination (CIE) = 80% of Max((M1+Q1+A1) , (M2+Q2+A2)) + 20% of Min((M1+Q1+A1) , (M2+Q2+A2))	30
Semester End Examination (SEE)(Unit-I, Unit – II, Unit –III, Unit-IV and Unit-V)	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 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: Communication:** Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
- PSO 2: VLSI and Embedded Systems:** 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: Signal Processing:** Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Date: 31-01-2026

Course Instructor
M.Sambasiva Reddy

Course Coordinator
Dr.K.Ravi Kumar

Module Coordinator
Dr.B.V.N.R Siva Kumar

HOD
Dr.G.Srinivasulu



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with "A" Grade & NBA for ASE, CE, CSE, ECE, EEE & IT (Under Tier - I)

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Phone: 08659-222933, Fax: 08659-222931

DIVISION OF CHEMISTRY

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Y. Subbareddy & Dr.S.L.V.Rajesh Babu

Course Name & Code : Chemistry Lab & 23FE52

L-T-P Structure : 0-0-3

Program/Sem/Sec : I B.Tech./II Sem/ECE-D

Credits: 1.5

A.Y. : 2025-26

Pre requisites: Nil

Course Educational Objective:

- To enable the students to perform different types of volumetric titrations.
- It provides an overview of preparation of polymers, nanomaterials and analytical techniques.

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

CO1: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (**Analyze**)

CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. (**Apply**)

CO3: Measure the strength of acid present in Pb-Acid battery. (**Apply**)

CO4: Analyze important parameters of water to check its suitability for drinking purpose and industrial applications. (**Analyze**)

CO5: Improve individual / teamwork skills, communication and report writing skills with ethical values. (**Apply**)

POs \ COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	1	2	-	-	-	-	-
CO2	3	-	1	-	-	2	1	-	-	-	-	-
CO3	3	2	1	-	-	-	2	-	-	-	-	-
CO4	3	1	-	-	-	-	-	-	-	-	-	-
CO5	3	2	-	-	2	-	-	-	-	-	-	-
1 = Slight (Low)			2 = Moderate (Medium)				3 = Substantial (High)					

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 Lab Manual

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): ECE-D

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly	
1.	Introduction to Chemistry lab, CO's, PO's	3	03-02-2026		TLM1	CO1		
2.	Explanation of chemicals and glassware	3	10-02-2026		TLM4	CO1		
3.	Preparation of a Bakelite	3	17-02-2026		TLM4	CO2		
4.	Measuring of pH of water sample	3	24-02-2026		TLM4	CO4		
5.	Determination of amount of HCl using standard Na ₂ CO ₃ solution	3	10-03-2026		TLM4	CO1		
6.	Determination of Strength of an acid in Pb-Acid battery	3	17-03-2026		TLM4	CO3		
7.	Estimation of total hardness of given water sample	3	31-03-2026		TLM4	CO1		
8.	Alkalinity of water sample	3	07-04-2026		TLM4	CO1		
9.	Estimation of Ferrous ion by permanganometry	3	21-04-2026		TLM4	CO4		
10.	Estimation of Ferrous ion by Dichrometry	3	28-04-2026		TLM4	CO4		
11.	Conductometric titration of strong acid <i>versus</i> strong base	3	05-05-2026		TLM4	CO1		
12.	Conductometric titration of weak acid <i>versus</i> strong base	3	12-05-2026		TLM4	CO1		
13.	Additional experiment/repeat	3	02-06-2026		TLM4	CO1		
14.	Internal	3	09-06-2026		TLM4	CO1		
	Total			14				

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:

According to Academic Regulations of R23 Distribution and Weightage of Marks for Laboratory Courses is as follows.

(a) Continuous Internal Evaluation (CIE):

- ✓ The continuous internal evaluation for laboratory course is based on the following parameters:

Evaluation Task	Marks
Day-to-Day Work	A1 = 10
Record & Observation	B1 = 5
Internal Exam	C1 = 15
Cumulative Internal Examination (CIE): (A1+B1+C1)	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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Y. Subbareddy	Dr. V.Parvathi	Dr. V.Parvathi	Dr. T.Satyanarayana
Signature				



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DEPARTMENT OF COMPUTERSCIENCE &ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: Mr. Amanatulla Mohammad	
Course Name & Code	: Computer Programming Lab (23CS51)	
L-T-P Structure	: 0-0-3	Credits:1.5
Program/Sem/Sec	: B.Tech. -ECE/II/D-Sec.	A.Y. :2025-26

PRE-REQUISITE: Fundamentals of Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO): The course aims to give students hands – on experience and train them on the concepts of the C- programming language.

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

CO1:	Read, understand, and trace the execution of programs written in C language. (Understand)	Apply–Level2
CO2:	Select the right control structure for solving the problem. (Apply)	Apply–Level3
CO3:	Develop C programs which utilize memory efficiently using programming constructs like pointers. (Apply)	Apply–Level3
CO4:	Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C. (Apply)	Apply–Level3
CO5:	Improve individual / teamwork skills, communication and report writing skills with ethical values.	

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	2	-	-	3	-	-	-	-	-	-	-	-	-	-
CO2	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
CO3	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
CO4	3	2	2	-	3	-	-	-	-	-	-	-	-	-	-
CO5	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-
			1 -Low			2 -Medium			3- High						

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Week1: Familiarization with programming environment	03		04/02/26 11/02/26	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		18/02/26	DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03		25/02/26	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		04/03/26	DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03		11/03/26	DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03		18/03/26	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		01/04/26	DM5
8.	Week8: Exercise Program on 2 D arrays, sorting and Strings.	03		08/04/26	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		15/04/26	DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential	03		22/04/26	DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03		29/04/26	DM5
12.	Week 12: Exercise Programs on Recursion, the structure of	03		06/05/26	DM5
13.	Week 13: Exercise Programs on Call by reference, dangling	03		13/05/26	DM5
14.	Week 14: Exercise Programs on File handling.	03		03/06/26	DM5
15.	Lab Internal	03		10/06/26	DM5

Delivery Methods			
DM1	Chalk and Talk	DM4	Assignment/Test/Quiz
DM2	ICT Tools	DM5	Laboratory/Field Visit
DM3	Tutorial	DM6	Web-based Learning

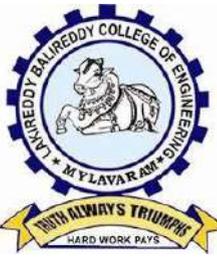
PART-C

P01	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
P02	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.
P03	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
P04	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.
P05	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
P06	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
P07	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.
P08	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
P09	Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
P010	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
P011	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.
P012	Life-long learning: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES(PSOs):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO2	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.
PSO3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	HOD
Name of the Faculty	Mr. Md. Amanatulla	Dr. B. Srinivasa Rao	Dr. Y. V. Bhaskar Reddy	Dr. S. Nagarjuna Reddy
Signature				



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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: P. KEERTHI/P. MOHANA GANGA RAJU

Course Name & Code : Engineering Workshop & 23ME51 **Regulation** : R23

L-T-P Structure : 0-0-3 **Credits** : 1.5

Program/Sem/Sec : B. Tech/II/ECE-D **A.Y.** : 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): To familiarize students with wood working, sheet metal operations, fitting, electrical house wiring skills, and basic repairs of two-wheeler vehicles.

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

CO1	Identify workshop tools and their operational capabilities. (Remember)
CO2	Practice on manufacturing of components using workshop trades including fitting, carpentry, foundry and welding. (Understand)
CO3	Apply fitting operations in various applications. (Apply)
CO4	Apply basic electrical engineering knowledge for House Wiring Practice. (Apply)

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

COs	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PSO1	PSO2
CO1	3	2	1	1	-	-	-	-	-	-	-	2	3	2
CO2	3	2	1	1	-	-	-	-	-	-	-	2	3	2
CO3	3	2	1	1	-	-	-	-	-	-	-	2	3	2
CO4	3	2	1	1	-	-	-	-	-	-	-	2	3	2
		1 - Low			2 - Medium			3 - High						

Text books:

- T1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published, 2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.
- T2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

- R1. LBRCE Workshop Lab Manual.
 R2. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition.
 R3. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
 R4. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakash an, 2021-22.

PART-B**COURSE DELIVERY PLAN (LESSONPLAN):**

S.No.	Topics to be covered(Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
CYCLE-I						
1.	Introduction to Lab	3	06-02-2026		TLM4	
2.	Dove Tail Joint	3	13-02-2026		TLM4	
3.	Corner Lap Joint	3	20-02-2026		TLM4	
4.	T-Fitting	3	27-02-2026		TLM4	
5.	V-Fitting	3	06-03-2026		TLM4	
6.	Two Laps in Series and Parallel Connection with One Way Switch	3	13-03-2026		TLM4	
7.	Florescent Lamp and Calling Bell Circuit	3	20-03-2026		TLM4	
CYCLE-II						
8.	Preparation of Pipe Layout	3	10-04-2026		TLM4	
9.	Pipe Threading	3	17-04-2026		TLM4	
10.	Preparation of Rectangular Tray	3	24-04-2026		TLM4	
11.	Preparation of Open Scoop	3	01-05-2026		TLM4	
12.	Preparation Of S-Hook	3	08-05-2026		TLM4	
13.	Preparation of chisel,	3	15-05-2026		TLM4	
14.	Repetition Lab	3	05-06-2026		TLM4	
15.	Internal Lab Exam	3	12-06-2026		-----	
No. of classes required to complete				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
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PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work=A	1, 2,3, 4,5,6,7,8...	A=10
Record/ Viva=B	1,2,3,4,5,6,7,8	B=05
Internal Test=C	1,2,3,4,5,6,7,8	C=15
Cumulative Internal Examination: A+B+C=30	1,2,3,4,5,6,7,8	30
Semester End Examinations =D	1,2,3,4,5,6,7,8	70
Total Marks: A+B+C+D=100	1,2,3,4,5,6,7,8	100

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO1	To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
PEO2	To Function professionally in the rapidly changing world with advances in technology.
PEO3	To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
PEO4	To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner?

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
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
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
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):

PSO1	Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO2	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
PSO 3	Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Course Instructor

**Head of the
Department**

Signature

**Name of
the Faculty**

Mrs. P. KEERTHI

Dr. K V RAMANA



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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. M.Sambasiva Reddy
Course Name & Code : Network Analysis and Simulation Laboratory– 23EC51
L-T-P Structure : 0-0-3 Credits : 1.5
Program/Sem/Sec : B.Tech., ECE., II-Sem., Section- D A.Y : 2025-26

PRE-REQUISITE: Basic Electrical Engineering Concepts

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To gain hands on experience in verifying Kirchoff's laws and network theorems
- To analyze transient behavior of circuits
- To study resonance characteristics
- To determine 2-port network parameters

COURSE OUTCOMES (COs): At the end of the course, students are able to

CO1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits (Apply)
CO2	Design resonance circuit for given specifications (Analyze)
CO3	Measure time constants of RL & RC circuits (Apply)
CO4	Analyze the 1 st and 2 nd order circuits with respect to parameter variation (Analyze)
CO5	Characterize and model the network in terms of all network parameters (Apply)

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	2	2	-	1	2	-	-	-	-	2	1	2	2	1	-
CO2	2	2	-	1	2	-	-	-	-	2	2	2	3	1	-
CO3	2	2	-	1	1	-	-	-	-	2	1	2	1	2	-
CO4	2	3	-	1	2	-	-	-	-	2	1	2	2	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	1	2	-

Correlation Levels: 1-Slight (Low), 2-Moderate (Medium), 3-Substantial (High) and No correlation: '-'

PART-B**COURSE DELIVERY PLAN (LESSON PLAN): Section – D**

Exp t. No	Experiment/s	COs	No. of Classes Require d	Tentative Date of Completi on	Actual Date of Completi on	Teachi ng Learni ng Metho ds	HOD Sign Weekl y
--	Introduction to NA Lab experiments, COs, POs and PSOs	--	3	07-02-26		TLM1	
Cycle – I							
1	Experiment – 1	CO1,CO4	3	14-02-26		TLM4	
2	Experiment – 2	CO1,CO4	3	21-02-26		TLM4	
3	Experiment – 3	CO1,CO4	3	28-03-26		TLM4	
4	Experiment – 4	CO1,CO4	3	07-03-26		TLM4	
5	Experiment – 5	CO1,CO4	3	14-03-26		TLM4	
6	Experiment – 6	CO2,CO4	3	04-04-26		TLM4	
Cycle – II							
7	Experiment – 7	CO1,CO4	3	11-04-26		TLM4	
8	Experiment – 8	CO1,CO4	3	18-04-26		TLM4	
9	Experiment – 9	CO2,CO4	3	25-04-26		TLM4	
10	Experiment – 10	CO3,CO4	3	02-05-26		TLM4	
11	Experiment – 11	CO3,CO4	3	09-05-26		TLM4	
12	Experiment – 12	CO3,CO4	3	16-05-26		TLM4	
13	Experiment beyond the syllabus		3	06-06-26		TLM4	
--	Internal Examination	--	3	13-06-26			

Experiments to be conducted:

Exp. No	CYCLE-1	Exp. No	CYCLE-2
1	Study of components of a circuit and Verification of KCL and KVL	7	To study the transient and steady state response of a 2 nd order circuit by varying its various parameters and studying their effects on responses
2	Verification of mesh and nodal analysis for AC circuits	8	Find the Q Factor and Bandwidth of a Series and Parallel Resonance circuit
3	Verification of Superposition, Thevenin's & Norton theorems for AC circuits	9	Determination of open circuit (Z) and short circuit (Y) parameters
4	Verification of maximum power transfer theorem for AC circuits	10	Determination of hybrid (H) and transmission (ABCD) parameters
5	Study of DC transients in RL, RC and RLC circuits	11	Determination of hybrid (H) and transmission (ABCD) parameters
6	To study frequency response of various 1 st order RL & RC networks	12	To measure two port parameters of a twin-T network and study its frequency response.

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:**

Evaluation Task	Expt. no's	Marks
Day to Day work = A	1,2,3,4,5,6,7,8...	A = 10
Record = B	1,2,3,4,5,6,7,8...	B = 05
Internal Test = C	1,2,3,4,5,6,7,8...	C = 15
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8...	30
Semester End Examinations = D	1,2,3,4,5,6,7,8...	70
Total Marks: A + B + C + D = 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:	Communication: Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
PSO 2:	VLSI and Embedded Systems: 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:	Signal Processing: Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Course Instructor
Mr. M.Sambasiva Reddy

Course Coordinator
Dr.B.Siva Hari Prasad

Module Coordinator
Dr.B.V.N.R. Siva Kumar

HOD
Dr. G.Srinivasulu



COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. B. Sreenivasa Reddy

Course Name :Advanced English Language Proficiency in LSRW Skills

L-T-P Structure :1-0-0

Program/Sem/Sec : B. Tech- I -II SEM ; ECE- D

Academic Year :2025-26

PREREQUISITE :NIL

Course Educational Objectives:

The LSRW course is designed to enhance students' abilities in the four essential language skills: Listening, Speaking, Reading, and Writing. It focuses on improving communication effectiveness across academic, professional, and social settings.

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

CO1	Enhance active listening skills to comprehend, analyze, and respond effectively in academic and professional contexts.	L2
CO2	Develop confident and articulate speaking abilities for effective communication in formal and informal settings.	L3
CO3	Strengthen reading comprehension skills to interpret, evaluate, and synthesize information from various texts.	L3
CO4	Improve writing proficiency to produce clear, coherent, and grammatically accurate content for academic and professional purposes.	L3

Module-1: Listening Skills

- Listening & repeating 1-2 sentences
- Listening comprehension followed by MCQs

Module-2: Speaking Skills

- Pronunciation practice- Jam sessions- Video Recording
- Speaking drills (words → phrases → sentences)
- Short speech (30–60 seconds): topics & prompts

Module-3: Reading Skills

- Reading sentences and paragraphs – (TOEFL)
- Reading comprehension practice (factual & inferential)
- Synonyms, antonyms, analogy, similes (for Verbal Ability tests)

Module-4: Writing Skills

- Error spotting –Correction of sentences
- Correction of jumbled sentences (word & sentence sequencing)
- Cloze test (with options)

Module-5: Grammar - MCQs model (aligned with CTS/Infosys)

- Articles & Prepositions
- Tenses (Present, Past, Future forms)
- Active and Passive Voice
- Basic Error Identification
- Subject-Verb Agreement
- Common Errors in Usage

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.	Introduction Listening and repeating 1-2 sentences	1	04-02-2026		
2.	Listening Comprehension followed by MCQs	1	11-02-2026		
3.	Pronunciation Practice-JAM sessions- Video recording	2	18-02-2026		
4.	Speaking drill (words-phrases-sentences)	1	25-02-2026		
5.	Short speech (30–60 seconds): topics & prompts	1	04-03-2026		
6.	Reading sentences and paragraphs	1	11-03-2026		
7.	Reading comprehension practice (factual & inferential)	1	18-03-2026		
8.	Synonyms, antonyms, analogy, similes (for Verbal Ability tests)	1	01-04-2026		
9.	Error spotting –Correction of sentences	1	08-04-2026		
10.	Correction of jumbled sentences (word & sentence sequencing)	1	15-04-2026		
11.	Cloze test (with options)	1	22-04-2026		
12.	Articles & Prepositions Tenses (Present, Past, Future forms)	1	29-04-2026		
13.	Basic Error Identification Subject-Verb Agreement	1	06-05-2026		
14.	Common Errors in Usage	1	13-05-2026		
No. of classes required to complete Syllabus: 15					

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.B. Sreenivasa Reddy	Dr R Padma Venkat	Dr R Padma Venkat	Dr. T Satyanarayana
Signature				