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

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. V.Parvathi
Course Name & Code :Chemistry & 23FE02
L-T-P Structure :3-0-0 **Credits:03**
Program/Sem/Sec : B.Tech/*II sem*/ ECE A **A.Y. :**2024-25

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 energydiagrams 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 differentapplications(Understand)
CO4	Outline the importance of polymers and conducting polymers in advancedtechnologies(Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basicprinciples 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, DhanpatRai, 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. Billmayer Jr, 3rd Edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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	1	20-01-2025		TLM1	
2		1	22-01-2025		TLM1	
3		1	23-01-2025		TLM1	
4		1	24-01-2025		TLM1	
5	Fundamentals Of Quantum Mechanics	1	27-01-2025		TLM1	
6	Fundamentals Of Quantum Mechanics	1	29-01-2025		TLM1	
7	Fundamentals Of Quantum Mechanics	1	30-01-2025		TLM1	
8	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules	1	31-01-2025		TLM1	
9	Practice of examples	1	03-02-2025		TLM1	
10	Practice of examples	1	05-02-2025		TLM1	
11	Energy level diagrams of O_2 and CO	1	06-02-2025		TLM1	
12	Practice of examples	1	07-02-2025		TLM1	
13	π-molecular orbitals of butadiene	1	10-02-2025		TLM1	
14	π-molecular orbitals of benzene	1	12-02-2025		TLM1	
15	Schrodinger Wave Equation & Significance of Ψ and Ψ^2		13-02-2025		TLM1	
16	Particle In one dimensional box	1	14-02-2025		TLM1	
17	Practice of above derivations	1	17-02-2025		TLM1	
No. of classes required to complete UNIT-I: 17				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	19-02-2025		TLM1	
2.	Semiconductors - Basic concept,	1	20-02-2025		TLM1	
3.	Doping and & applications	1	21-02-2025		TLM1	
4.	Super conductors - Introduction	1	24-02-2025		TLM1	
5.	Super conductors - Basic concept&applications	1	27-02-2025		TLM1	
6.	Supercapacitors - Basic concept	1	28-02-2025		TLM2	
7.	Classification, Applications of super capacitors	1	03-03-2025		TLM2	
8.	Nano materials - classification	1	05-03-2025		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	06-03-2025		TLM2	
10	Nano materials - carbon nano tubes and graphene nanoparticles	1	07-03-2025		TLM2	
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.	Mid I Analysis	1	19-03-2025		TLM2	
2.	Electrochemical cell and basic concepts of electrochemistry.	1	20-03-2025		TLM1	
3.	Cell potential calculations and numerical problems	1	21-03-2025		TLM1	
4.	Continue...numerical problems.	1	24-03-2025		TLM1	
5.	Continue...numerical problems	1	26-03-2025		TLM1	
6.	Potentiometry-potentiometric titrations (redox titrations)	1	27-03-2025		TLM1	
7.	Concept of conductivity, conductivitycell,conducto metric titrations (acid-base titrations)	1	28-03-2025		TLM1	

8.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	02-04-2025		TLM1	
9	Primary cells – Zinc-air battery, Secondary cells – - working of the batteries including cell reactions	1	03--04-2025		TLM1	
10	lithium-ion batteries working of the batteries including cell reactions	1	04-04-2025		TLM1	
11	Fuel cells, hydrogen-oxygen fuel cell– working of the cells, Polymer electrolyte membrane fuel cells (PEMFC)	1	07-04-2025		TLM1	
12	Nernst equation and problems	1	09-04-2025		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	10-04-2025		TLM1	
2.	Thermo and Thermosetting plastics, types of polymerisation with examples.	1	11-04-2025		TLM1	
3.	Mechanisms of addition polymerisation	1	16-04-2025		TLM1	
4.	Mechanism of step growth polymerization.	1	17-04-2025		TLM1	
5.	Mechanism coordination polymerization, with specific example.	1	21-04-2025		TLM1	
6.	Preparation, properties and applications of – PVC, Teflon, Nylon-6,6, carbon fibres	1	23-04-2025		TLM1	
7	Preparation, properties and applications of Bakelite,	1	24-04-2025		TLM1	
8	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	25-04-2025		TLM1	

9	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	28-04-2025		TLM1	
10	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	30-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 10				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	01-05-2025		TLM2	
2.	Absorption of radiation: Beer-Lambert's law	1	02-05-2025		TLM2	
3.	UV-Visible Spectroscopy	1	05-05-2025		TLM2	
4.	electronic transition, Instrumentation	1	07-05-2025		TLM2	
5.	IR spectroscopies, fundamental modes	1	08-05-2025		TLM2	
6.	selection rules, Instrumentation of IR spectroscopy	1	09-05-2025		TLM2	
7.	Applications of IR spectroscopy	1	12-05-2025		TLM2	
8.	Chromatography-Basic Principle	1	14-05-2025		TLM2	
9	Classification-HPLC: Principle, Instrumentation and Applications	1	14-05-2025		TLM2	
10	Cont… chromatography	1	15-05-2025		TLM2	
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.	1	16-05-2025		TLM2	
2	Applications of polymers in advanced technologies .	1	16-05-2025		TLM2	

Teaching Learning Methods

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

PART-C

EVALUATION PROCESS (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 engineeringproblems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics 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 appropriateconsiderationforthepublichealthandsafety,andthecultural,societal,andenviron mentalconsiderations.
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 theinformation to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and 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, beingable to comprehend andwriteeffectivereportsanddesigndocumentation,makeeffectivepresentations,andgivean dreceiveclear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of theengineeringandmanagementprinciplesandapplythesetoone'sownwork,asamemberandle aderinateam, 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. V.Parvathi**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., ECE-A
ACADEMIC YEAR	**:** 2024-25
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** CH.Padma
COURSE COORDINATOR	**:** Dr. K.R. Kavitha
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", 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	20-01-25		TLM2			
2.	Course Outcomes, Program Outcomes	1	23-01-25		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	24-01-25		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	24-01-25		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	25-01-25		TLM1	CO1	T1,T2	
6.	Exact DE	1	27-01-25		TLM1	CO1	T1,T2	
7.	Exact DE	1	30-01-25		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	31-01-25		TLM1	CO1	T1,T2	
9.	TUTORIAL - I	1	31-01-25		TLM3	CO1	T1,T2	
10.	Non-exact DE Type II	1	01-02-25		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	03-02-25		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	06-02-25		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	07-02-25		TLM1	CO1	T1,T2	
14.	TUTORIAL – II	1	07-02-25		TLM3	CO1	T1,T2	
15.	Newton's Law of cooling		08-02-25		TLM1	CO1	T1,T2	
16.	Law of natural growth and decay	1	10-02-25		TLM1	CO1	T1,T2	
17.	Law of natural growth and decay	1	13-02-25		TLM1	CO1	T1,T2	
18.	Electrical circuits	1	14-02-25		TLM1	CO1	T1,T2	
19.	Electrical circuits	1	14-02-25		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
20.	Introduction to UNIT II	1	15-02-25		TLM1	CO1	T1,T2	
21.	Solving a homogeneous DE	1	17-02-25		TLM1	CO1	T1,T2	
22.	Solving a homogeneous DE	1	20-02-25		TLM1	CO1	T1,T2	
23.	Finding Particular Integral, P.I for e^{ax+b}	1	21-02-25		TLM1	CO1	T1,T2	

24.	P.I for Cos bx, or sin bx	1	21-02-25		TLM1	CO1	T1,T2	
25.	P.I for polynomial function	1	22-02-25		TLM1	CO1	T1,T2	
26.	P.I for	1	24-02-25		TLM1	CO1	T1,T2	
27.	P.I for	1	27-02-25		TLM1	CO1	T1,T2	
28.	Method of Variation of parameters	1	28-02-25		TLM1	CO1	T1,T2	
29.	TUTORIAL – III	1	28-02-25		TLM3	CO1	T1,T2	
30.	Method of Variation of parameters	1	01-03-25		TLM1	CO1	T1,T2	
31.	Simultaneous linear equations	1	03-03-25		TLM1	CO1	T1,T2	
32.	Simultaneous linear equations	1	06-03-25		TLM1	CO1	T1,T2	
33.	L-C-R circuits	1	07-03-25		TLM1	CO1	T1,T2	
34.	TUTORIAL – IV	1	07-03-25		TLM3	CO1	T1,T2	
35.	Simple Harmonic motion	1	08-03-25		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		16			No. of classes taken:			

I MID EXAMINATIONS (01-04-2024 TO 06-04-2024)

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
36.	Introduction to Unit III	1	17-03-25		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary constants	1	20-03-25		TLM1	CO2	T1,T2	
38.	Formation of PDE by elimination of arbitrary functions	1	21-03-25		TLM1	CO2	T1,T2	
39.	Formation of PDE by elimination of arbitrary functions	1	21-03-25		TLM1	CO2	T1,T2	
40.	Solving of PDE	1	22-03-25		TLM1	CO2	T1,T2	
41.	Solving of PDE	1	24-03-25		TLM1	CO2	T1,T2	
42.	Lagrange's Method	1	27-03-25		TLM1	CO2	T1,T2	
43.	Lagrange's Method	1	28-03-25		TLM1	CO2	T1,T2	
44.	TUTORIAL – III	1	28-03-25		TLM3	CO2	T1,T2	
45.	Homogeneous Linear PDE with constant coefficients	1	29-03-25		TLM1	CO2	T1,T2	

46.	Homogeneous Linear PDE with constant coefficients	1	03-04-25		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentia

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
47.	Introduction to UNIT IV	1	04-04-25		TLM1	CO3	T1,T2	
48.	Vector Differentiation	1	04-04-25		TLM1	CO3	T1,T2	
49.	Gradient	1	07-04-25		TLM1	CO3	T1,T2	
50.	Directional Derivative	1	10-04-25		TLM1	CO3	T1,T2	
51.	Directional Derivative	1	11-04-25		TLM1	CO3	T1,T2	
52.	TUTORIAL IV	1	11-04-25		TLM3	CO3	T1,T2	
53.	Divergence	1	12-04-25		TLM1	CO3	T1,T2	
54.	Curl	1	17-04-25		TLM1	CO3	T1,T2	
55.	Problems	1	19-04-25		TLM1	CO3	T1,T2	
56.	Solenoidal fields, Irrotational fields, potential surfaces	1	21-04-25		TLM1	CO3	T1,T2	
57.	Solenoidal fields, Irrotational fields, potential surfaces	1	24-04-25		TLM1	CO3	T1,T2	
58.	Laplacian, second order operators	1	25-04-25		TLM1	CO3	T1,T2	
59.	TUTORIAL V	1	25-04-25		TLM3	CO3	T1,T2	
60.	Vector Identities	1	26-04-25		TLM1	CO3	T1,T2	
61.	Vector Identities	1	28-04-25		TLM1	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
62.	Introduction to Unit-V	1	01-05-25		TLM1	CO4	T1,T2	
63.	Line Integral	1	02-05-25		TLM1	CO4	T1,T2	
64.	Circulation	1	02-05-25		TLM1	CO4	T1,T2	
65.	Work done	1	03-05-25		TLM1	CO4	T1,T2	
66.	Surface Integral	1	05-05-25		TLM1	CO4	T1,T2	
67.	Flux	1	08-05-25		TLM1	CO4	T1,T2	
68.	Green's Theorem	1	09-05-25		TLM1	CO4	T1,T2	
69.	TUTORIAL VI	1	09-05-25		TLM3	CO4	T1,T2	
70.	Green's Theorem	1	10-05-25		TLM1	CO4	T1,T2	
71.	Stoke's Thoerem	1	12-05-25		TLM1	CO4	T1,T2	

72.	Divergence Theorem	1	15-05-25		TLM1	CO4	T1,T2	
73.	Divergence Theorem	1	16-05-25		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			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	16-05-25 17-05-25		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	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering

	community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

CH.Padma	**Dr. K.R. Kavitha**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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: M.KARTHIK KUMAR
Course Name & Code **:** Basic Civil and Mechanical Engineering &23CM01
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech, II SEM- ECE_A SEC **A.Y.:** 2024-25

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	17-1-2025		**TLM2**	
2.	**Basics of Civil Engineering:** Role of Civil Engineers in Society	1	18-1-2025		**TLM2**	
3.	Various Disciplines of Civil Engineering- Structural Engineering-	1	21-1-2025		**TLM2**	
4.	Geo-technical- Transportation Engineering Hydraulics and Water Resources Engineering	1	22-1-2025		**TLM2**	
5.	Building Construction and Planning, Construction Materials	1	24-1-2025		**TLM2**	
6.	Cement -types Aggregate types- Bricks- classifications,	1	25-1-2025		**TLM2**	
7.	Steel-properties - types	1	28-1-2025		**TLM2**	
8.	Cement concrete- Applications	1	29-1-2025		**TLM2**	
9.	Introduction to Prefabricated construction Techniques	1	31-1-2025		**TLM2**	
No. of classes required to complete UNIT-I: 9				**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
10.	Introduction Surveying	1	1-2-2025			
11.	Objectives of Surveying, Horizontal Measurements	1	4-2-2025		**TLM2**	
12.	Compass Surveying overview- Angular Measurements and Introduction to Bearings	1	5-2-2025		**TLM2**	
13.	Simple problems on bearings	1	7-2-2025		**TLM1**	
14.	Levelling introduction, Levelling instruments used for levelling	1	8-2-2025		**TLM1**	

15.	Simple problems on levelling and bearings	1	11-2-2025		**TLM1**	
16.	problems on levelling	1	12-2-2025		**TLM2**	
17.	Contour mapping	1	14-2-2025		**TLM2**	
18.	Problems On partices	1	15-2-2025		**TLM2**	
No. of classes required to complete UNIT-II:09				**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	18-2-2025		**TLM2**	
20.	Types of Highway Pavements	1	19-2-2025		**TLM2**	
21.	Flexible Pavements - Rigid Pavements , Simple Differences	1	21-2-2025		**TLM2**	
22.	Basics of Harbour, Tunnel	1	22-2-2025		**TLM2**	
23.	Basics of Airport, and Railway Engineering	1	25-2-2025		**TLM2**	
24.	**Water Resources and Environmental Engineering** Introduction, -	1	28-2-2025		**TLM2**	
25.	Sources of water, Quality of water-Specifications	1	1-3-2025		**TLM2**	
26.	Introduction to Hydrology	1	4-3-2025		**TLM2**	
27.	Rainwater Harvesting-Water Storage	1	5-3-2025		**TLM2**	
28.	Conveyance Structures	1	7-3-2025		**TLM2**	
29.	(Simple introduction to Dams and Reservoirs),	1	8-3-2025		**TLM2**	
30.	**Mid-II exams**					
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) Civil	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-I, II & III) mechanical	A2=5
II- Descriptive Examination (Unit-I, II & III)	M2=15
II-Quiz Examination (Unit-I, II & III)	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.
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PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
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**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**M.KARTHIK KUMAR**	**B.RAMAKRISHNA**	**B.RAMAKRISHNA**	**Dr.J.Venkateswara rao**
Signature				

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Department of Electronics and Communication Engineering

COURSE HANDOUT

Program/Sem/Sec : B.Tech., ECE., II-Sem., Section–A
Academic Year : 2024-25
Course Name & Code : Introduction to Programming (23CS01)
L-T-P-Cr Structure : 3-0-0-3
Course Instructor : Anand Thota

Course Objectives:

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

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

CO 1	Understand basics of computers, the concept of algorithm and algorithmic thinking	L2
CO 2	Analyze a problem and develop an algorithm to solve it.	L4
CO 3	Implement various algorithms using the C programming language.	L3
CO 4	Understand more advanced features of C language.	L2
CO 5	Develop problem-solving skills and the ability to debug and optimize the code.	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	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-

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

Text Books (T):

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 (R):

R1: Computing fundamentals and C Programming, Balagurusamy, E., McGraw-Hill Education, 2008.

R2: Programming in C, ReemaThareja, Oxford, 2016, 2nd edition

R3: C Programming, A Problem Solving Approach, Forouzan, Gilberg, Prasad, CENGAGE, 3rd edition

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	21-01-2025			
2.	History of Computers	1	22-01-2025			
3.	Basic organization of a computer: ALU, input-output units.	1	23-01-2025			
4.	Memory, program counter	1	25-01-2025			
5.	Introduction to Programming Languages,	1	28-01-2025			
6.	Basics of a Computer Program Algorithms	1	29-01-2025			
7.	Flowcharts (Using Dia Tool), pseudo code	1	30-01-2025			
8.	Introduction to Compilation and Execution	1	01-02-2025			
9.	Primitive Data Types	1	04-02-2025			
10.	Variables, and Constants, Basic Input and Output operations	1	05-02-2025			
11.	Type Conversion, and Casting	1	06-02-2025			
12.	Problem solving techniques: Algorithmic approach, characteristics of algorithm	1	11-02-2025			
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	12-02-2025			
14.	Time and space complexities of algorithms.	1	13-02-2025			
No. of classes required to complete UNIT-I: 14			**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
1.	Simple sequential programs	1	15-02-2025			
2.	Conditional Statements (if, if-else, switch)	3	18-02-2025 19-02-2025 20-02-2025			

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
3.	Example programs on Decision Making and Branching	1	22-02-2025			
4.	Loops (for, while, do-while)	4	25-02-2025 27-02-2025 01-03-2025 04-03-2025			
5.	Example programs on Loops	1	05-03-2025			
6.	Break and Continue	1	06-02-2025			
7.	Example programs on Loops	1	11-03-2025			
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
1.	Arrays Introduction, Declaration	1	12-03-2025			
2.	Array indexing, Accessing elements	1	13-03-2025			
3.	Memory model	1	15-03-2025			
4.	Programs with array of integers	1	25-03-2025			
5.	Introduction to two dimensional arrays	1	26-03-2025			
6.	2D Array indexing, Accessing elements	1	27-03-2025			
7.	Programs with 2D arrays	1	29-03-2025			
8.	Introduction to Strings	1	01-04-2025			
9.	Reading and Writing Operations on Strings	1	02-04-2025			
10.	String Handling Functions	1	03-04-2025			
11.	Example Programs using Strings	1	08-04-2025			
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
1.	Introduction to Pointers	1	09-04-2025			
2.	Dereferencing and address operators	1	10-04-2025			
3.	Pointer and address arithmetic	1	15-04-2025			
4.	Array manipulation using pointers	1	16-04-2025			
5.	User-defined data types	1	17-04-2025			
6.	Structures, Definition and Initialization	1	19-04-2025			

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
7.	Example programs	2	22-04-2025 23-04-2025			
8.	Unions	1	24-04-2025			
9.	Example programs	1	26-04-2025			
No. of classes required to complete UNIT-IV: 10			**No. of classes taken:**			

UNIT-V: Functions & 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
1.	Introduction to Functions	1	29-04-2025			
2.	Function Declaration and Definition	1	30-04-2025			
3.	Function call Return Types	1	01-05-2025			
4.	Arguments	1	03-05-2025			
5.	Modifying parameters inside functions using pointers	2	06-05-2025 07-05-2025			
6.	Arrays as parameters	1	08-05-2025			
7.	Scope and Lifetime of Variables	1	13-05-2025			
8.	Introduction to Files	1	14-05-2025			
9.	Basics of File Handling	1	15-05-2025			
10.	Operations on Files	2	17-05-2025 20-05-2025			
No. of classes required to complete UNIT-V: 12			**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
1.	Application Development using C	1	21-05-2025			
2.	Introduction to Data Structures	1	22-05-2025			

Teaching Learning Methods:

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

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 (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**

PROGRAMME OUTCOMES (POS) & PROGRAMME SPECIFIC OUTCOMES (PSOS):

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 and business 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 and business practices
PO 7:	**Environment and sustainability:** Understand the impact of the professional engineering solutions in business 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 and business practices
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, business 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:	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.

Anand Thota

Course Instructor | **Course Coordinator** | **Module Coordinator** | **HOD**

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Department of Electronics and Communication Engineering

COURSE HANDOUT

PART: A

Program/Sem/Sec : B.Tech., ECE., II-Sem., Section – A
Academic Year : 2024-25
Course Name & Code : Network Analysis – 23EC01
L-T-P-Cr Structure : 3-0-0-3
Course Instructor : Mr.CH.Mallikharjuna Rao

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 will be able to

CO 1	Apply fundamental laws and theorems to compute electrical variables of DC circuits (Apply – L3)	L3
CO 2	Analyze electrical networks during transients in the Laplace domain (Apply – L3)	L3
CO 3	Apply fundamental laws and theorems to compute electrical variables of AC electricalcircuits (Apply – L3)	L3
CO 4	: 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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	3	-	-	-	-	-	-	-	-	-	2	2	1	-
CO 2	3	3	1	-	-	-	-	-	-	-	-	2	3	1	-
CO 3	3	3	1	-	-	-	-	-	-	-	-	2	1	2	-
CO 4	2	3	-	-	-	-	-	-	-	-	-	1	2	2	-
CO5	2	2	-	-	-	-	-	-	-	-	-	2	1	2	-
CO6	2	2	2	-	-	-	-	-	-	-	-	1	1	2	-

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

Textbooks (T) and References (R):

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 th Edition 2020

T3: Network lines and Fields by John. D. Ryder 2 nd Edition, PHI

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)

UNIT-I: Types of circuit components & Circuit Theorems

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.	Types of Sources and Source Transformations	1	20.01.2025		TLM1	
2.	Mesh analysis	1	21.01.2025		TLM1	
3.	Nodal analysis	1	22.01.2025		TLM1	
4.	Mesh analysis, Nodal analysis including dependent sources. Principle of Duality.	1	24.01.2025		TLM1	
5.	Thevenin's Theorems, Norton's Theorems	1	27.01.2025		TLM1	
6.	Milliman's Theorems, Reciprocity.	1	28.01.2025		TLM1	
7.	Compensation, Substitution Theorems	1	29.01.2025		TLM1	
8.	Superposition Theorems.	1	31.01.2025		TLM1	
9.	Max Power Transfer Theorems	1	03.02.2025		TLM1	
10.	Tellegens Theorems	1	04.02.2025		TLM1	
No. of classes required to complete UNIT-I : 10			No. of classes taken :			

UNIT-II: Transients & Laplace transform

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.	First-order differential equations	1	05.02.2025		TLM1	
2.	Definition of time constants, R-L circuit, R- C circuit with DC excitation	1	07.02.2025		TLM1	
3.	Evaluating initial conditions procedure	1	10.02.2025		TLM1	
4.	second order differential equations homogeneous, non-homogenous.	1	11.02.2025		TLM1	
5.	Problem-solving using R-L-C elements with DC excitation	1	12.02.2025		TLM1	
6.	Problem-solving using R-L-C elements with AC excitation	1	14.02.2025		TLM1	

7.	Response as related to s-plane rotation of roots.	1	17.02.2025		TLM1	
8.	Introduction, Laplace transformation		18.02.2025		TLM1	
9.	Basic theorems of Laplace transforms.		19.02.2025		TLM1	
10.	Problem-solving using Laplace transform		21.02.2025		TLM1	
11.	Partial fraction expansion		24.02.2025		TLM1	
12.	Heaviside's expansions		25.02.2025		TLM1	
13.	problem-solving using Laplace transform.		28.02.2025		TLM1	
14.	problem-solving using Laplace transform.		03.03.2025		TLM1	
No. of classes required to complete UNIT-II: 14			**No. of classes taken :**			

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

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.	Impedance concept	1	04.03.2025		TLM1	
2.	phase angle	1	05.03.2025		TLM1	
3.	series R-L, R-C, R-L-C circuits problem solving	1	07.03.2025		TLM1	
4.	series R-L, R-C, R-L-C circuits problem solving	1	17.03.2025		TLM1	
5.	Complex impedance and phasor notation for R-L, R-C, R-L-C	1	18.03.2025		TLM1	
6.	Complex impedance and phasor notation for R-L-C	1	19.03.2025		TLM1	
7.	problem-solving using mesh analysis.	1	21.03.2025		TLM1	
8.	problem-solving using nodal analysis.	1	24.03.2025		TLM1	
9.	Star-Delta conversion	1	25.03.2025		TLM1	
10	Delta-Star conversion, Problem solving using Laplace transforms.	1	26.03.2025		TLM1	
No. of classes required to complete UNIT-III : 10			**No. of classes taken :**			

UNIT-IV : Resonance & Coupled Circuits

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 concept of resonance, Definition of Q, Series resonance	1	28.03.2025		TLM1	
2.	Bandwidth of series resonance	1	01.04.2025		TLM1	
3.	Parallel resonance	1	02.04.2025		TLM1	
4.	general case-resistance present in both branches	1	04.04.2025		TLM1	
5.	Anti-resonance at all frequencies	1	07.04.2025		TLM1	

6.	Self-inductance, Mutual inductance, Coefficient of coupling	1	08.04.2025	TLM1	TLM1	
7.	Analysis of coupled circuits, Natural current.	1	09.04.2025	TLM1	TLM1	
8.	Dot rule of coupled circuits	1	11.04.2025	TLM1	TLM1	
9.	Dot rule of coupled circuits	1	15.04.2025	TLM1	TLM1	
10.	conductively coupled equivalent circuits	1	16.04.2025	TLM1	TLM1	
11.	problem solving	1	21.04.2025	TLM1	TLM1	
12.	problem solving	1	22.04.2025	TLM1	TLM1	

UNIT-V : Two-port Networks & Image and iterative impedances

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.	Z-parameters	1	23.04.2025		TLM1	
2.	Y-parameters	1	25.04.2025		TLM1	
3.	Transmission line parameters	1	28.04.2025		TLM1	
4.	h- parameters	1	29.04.2025		TLM1	
5.	Relationships Between Parameter Set	1	30.042025		TLM1	
6.	Parallel & series connection of two-port networks	1	02.05.2025		TLM1	
7.	cascading of two-port networks	1	05.05.2025		TLM1	
8.	problem-solving using dependent sources also	1	06.05.2025		TLM1	
9.	Image and iterative transfer constants, Insertion loss	1	07.05.2025		TLM1	
10.	Attenuators and pads	1	09.05.2025		TLM1	
11.	Lattice network and its parameters.	1	12.05.2025		TLM1	
12.	Impedance matching networks.	1	13.05.2025		TLM1	
No. of classes required to complete UNIT-V : 12			**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
1.	Graph Theory	1	14.05.2025		TLM2	
2.	Tie set and cut set methods.	1	16.05.2025		TLM2	

Teaching Learning Methods

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

PART-C: EVALUATION PROCESS:

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

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

Dt:13.01.2025

Course Instructor	Course Coordinator	Module Coordinator	HOD
CH.Mallikharjuna Rao	CH.Mallikharjuna Rao	Dr.T.Satyanarayana	Dr. G. Srinivasulu

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

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. V.Parvathi &Mrs.K.Sri Lakshmi
Course Name & Code **:** Chemistry Lab&23FE52
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech/ I sem/ ECEA **A.Y. :**2024-25

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.

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**)

Course Outcomes: After completion of the course, the students will be able to,

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): Section-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	3	21-01-2025		TLM1		
2.	Introduction to chemistry lab	**3**	28-01-2025		TLM4		
3.	Demonstration of volumetric analysis	3	04-02-2025		TLM4	CO1	
4.	Preparation of a Bakelite	3	11-02-2025		TLM4	CO2	
5.	Determination of amount of HCl using standard Na2CO3 solution	3	18-02-2025		TLM4	CO1	
6.	Determination of Strength of an acid in Pb-Acid battery	3	25-02-2025		TLM4	CO3	
7.	Estimation of Ferrous Iron by Dichrometry	3	04-03-2025		TLM4	CO1	
8.	Estimation of Ferrous Iron by permanganometry	3	18-03-2025		TLM4	CO1	
9	Estimation of total hardness of water by EDTA method	3	25-03-2025		TLM4	CO4	
10.	Determination of alkalinity And concentration of individual ions	3	01-04-2025		TLM4	CO4	
11.	Conductometric titration of strong acid vs. strong base	3	08-04-2025		TLM4	CO1	
12.	Conductometric titration of weak acid vs. strong base	3	15-04-2025		TLM4	CO1	
13	Measurement of pH//Revision/ Experiment for absentees for regular lab.	3	22-04-2025		TLM4	CO4	
14	Revision / experiments for absentees for regular lab	3	29-04-2025		TLM4		
15	Revision / experiments for absentees for regular lab	3	08-05-2025		TLM4		
16	Internal Exam	3	13-05-2025				

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):

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 analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineeringsciences.
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 environmentalconsiderations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and researchmethodsincludingdesignofexperiments,analysisandinterpretationofdata,

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 thelimitations.
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 engineeringpractice.
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 sustainabledevelopment.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineeringpractice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinarysettings.
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 clearinstructions.
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 multidisciplinaryenvironments.
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.V.Parvathi**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

LAKIREDDY BALIREDDY COLLEGE OF ENGINEERING

(Autonomous Status Since the Academic Year 2010-11 & Extended upto2031-32)
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

Program/Sem/Sec	: **B.Tech., ECE., II-Sem., Section–A**
Academic Year	: **2024-25**
Course Name & Code	: **Computer Programming Lab (23CS51)**
L-T-P-Cr Structure	: **0-0-3-1.5**
Course Instructor	: **Anand Thota**

Course Objectives: 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, students will be able to

CO 1	Read, understand, and trace the execution of programs written in C language. (Understand)	L2
CO 2	Apply the right control structure for solving the problem. (Apply)	L3
CO 3	Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, basic concepts of pointers in C.(Apply).	L3
CO 4	Improve individual / teamwork skills, communication and report writing skills with ethical values.(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	-	-	3	-	-	-	-	-	-	-	2	-	-
CO2	3	2	2	-	3	-	-	-	-	-	-	-	3	-	-
CO3	3	2	2	-	3	-	-	-	-	-	-	-	3	-	-
CO4	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-

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

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	HOD Sign Weekly
1.	**Week 1:** Getting familiar with the programming environment on the computer and writing the first program.	1	23-01-2025	23-01-2025	**TLM5**	
2.	**Week 2:** Getting familiar with how to formally describe a solution to a problem in a series of finite steps both using textual notation and graphic notation.	1	30-01-2025	30-01-2025	**TLM5**	
3.	**Week 3:** Learn how to define variables with the desired data-type, initialize them with appropriate values and how arithmetic operators can be used with variables and constants	1	06-02-2025	06-02-2025	**TLM5**	
4.	**Week 4:** Explore the full scope of expressions, type-compatibility of variables & constants and operators used in the expression and how operator precedence works.	1	13-02-2025	13-02-2025	**TLM5**	
5.	**Week 5:** Explore the full scope of different variants of “if construct” namely if-else, nullelse, if-else if*-else, switch and nested-if including in what scenario each one of them can be used and how to use them. Explore all relational and logical operators while writing conditionals for “if construct”.	1	20-02-2025	20-02-2025	**TLM5**	
6.	**Week 6:** Explore the full scope of iterative constructs namely while loop, do-while loop and for loop in addition to structured jump constructs like break and continue including when each of these statements is more appropriate to use	1	27-02-2025	27-02-2025	**TLM5**	
7.	**Week 7:** Explore the full scope of Arrays construct namely defining and initializing 1- D and 2-D and more generically n-D arrays and referencing individual array elements from the defined array. Using integer 1-D arrays, explore search solution linear search.	1	06-03-2025	06-03-2025	**TLM5**	
8.	**Week 8:** Explore the difference between other arrays and character arrays that can be used as Strings by using null character and get comfortable with string by doing experiments that will reverse a string and concatenate two strings. Explore sorting solution bubble sort using integer arrays	1	13-03-2025	13-03-2025	**TLM5**	
9.	**Week 9:** Explore pointers to manage a dynamic array of integers, including memory allocation & value initialization, resizing changing and reordering the contents of an array and memory de-allocation using malloc (), calloc (), realloc () and free () functions. Gain experience processing command-line arguments received by C	1	27-03-2025	27-03-2025	**TLM5**	
10.	**Week 10:** Experiment with C Structures, Unions, bit fields and self-referential structures(Singly linked lists) and nested structures	1	03-04-2025	03-04-2025	**TLM5**	
11.	**Week 11:** Explore the Functions, sub-routines,	1	10-04-2025	10-04-2025	**TLM5**	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	scope and extent of variables, doing some experiments by parameter passing using call by value. Basic methods of numerical integration					
12.	**Week 12:** Explore how recursive solutions can be programmed by writing recursive functions that can be invoked from the main by programming at-least five distinct problems that have naturally recursive solutions	1	17-04-2025	17-04-2025	**TLM5**	
13.	**Week 13:** Explore the basic difference between normal and pointer variables, Arithmetic operations using pointers and passing variables to functions using pointers	1	24-04-2025	24-04-2025	**TLM5**	
14.	**Week 14:** To understand data files and file handling with various file I/O functions. Explore the differences between text and binary files.	1	01-05-2025	01-05-2025	**TLM5**	
15.	Internal Lab Exam	1	08-05-2025	08-05-2025	**TLM5**	
No. of classes required to complete UNIT-I: 15			**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

EVALUATION PROCESS

Evaluation Task	Marks
Internal Lab Exam	30
External Lab Exam	70
Total Marks	**100**

PROGRAMME OUTCOMES (POS) & PROGRAMME SPECIFIC OUTCOMES (PSOS)

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 and business 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 and business practices
PO 7:	**Environment and sustainability:** Understand the impact of the professional engineering solutions in business 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 and business practices
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, business 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:	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.

Anand Thota

Course Instructor | **Course Coordinator** | **Module Coordinator** | **HOD**

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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 : 2024-25

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	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (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	20/01/2025		TLM8	R1	
2	Experiment-1	3	27/01/2025		TLM8	R1	
3	Experiment-2	3	03/02/2025		TLM8	R1	
4	Experiment-3	3	10/02/2025		TLM8	R1	
5	Experiment-4	3	17/02/2025		TLM8	R1	
6	Experiment-5	3	24/02/2025		TLM8	R1	
7	Experiment-6	3	03/03/2025		TLM8	R1	
I-Mid Examinations (10.03.2025 to 15.03.2025)							
8	Experiment-7	3	17/03/2025		TLM8	R1	
9	Experiment-8	3	24/03/2025		TLM8	R1	
10	Demonstration on Tin smithy	3	31/03/2025		TLM8		
11	Demonstration on Black smithy	3	07/04/2025		TLM6		
12	Repetition lab	3	14/04/2025		TLM6		
13	Repetition lab	3	21/04/2025		TLM6		
14	Viva voce	3	28/04/2025				
	Viva voce	3	05/05/2025				
14	Lab Internal	3	12/05/2025				

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	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
Summer vacation	19-05-2025	31-05-2025	1W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical's	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	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: B-SEC

Batch No.	Reg.No.of Students	Number of Students
B1	24761A0401-417	17
B2	24761A0418-434	17
B3	24761A0435-451	17
B4	24761A0452-467	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**	**Dr. M. B. S Sreekara Reddy**	**Dr. M. B. S Sreekara Reddy**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Department of Electronics and Communication Engineering

COURSE HANDOUT

PART-A:

Program : B.Tech.,ECE.,II-Sem.,Section–A
Academic Year : 2024-25
Course Name & Code : Network Analysis and Simulation Laboratory– 23EC51
L-T-P-Cr : 0-0-3
Course Instructure : CH. Mallikharjuna Rao.

Course Objectives:

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

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

CO 1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits **(Apply)**
CO 2	Design resonance circuit for given specifications **(Analyze)**
CO 3	Measure time constants of RL & RC circuits **(Apply)**
CO 4	Analyze the 1st and 2nd 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
CO 1	2	2	-	1	2	-	-	-	-	2	1	2	-	1	-
CO 2	2	2	-	1	2	-	-	-	-	2	2	2	-	1	-
CO 3	2	2	-	1	1	-	-	-	-	2	1	2	-	2	-
CO 4	2	3	-	1	2	-	-	-	-	2	1	2	-	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	-	2	-

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

PART-B: COURSE DELIVERY PLAN (LESSON PLAN):

Expt. No	Experiment/s	COs	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
Cycle – I							
1	Introduction to NA Lab experiments, COs, POs and PSOs Experiment – 1	CO1,CO4	3	25.01.25		TLM4	
2	Experiment – 2	CO1,CO4	3	01.02.25		TLM4	
3	Experiment – 3	CO1,CO4	3	15.02.25		TLM4	
4	Experiment – 4	CO1,CO4	3	22.02.25		TLM4	
5	Experiment – 5	CO1,CO4	3	01.03.25		TLM4	
6	Experiment – 6	CO2,CO4	3	01.03.25		TLM4	
Cycle – II							
7	Experiment – 7	CO1,CO4	3	22.03.2025		TLM4	
8	Experiment – 8	CO1,CO4	3	29.03.2025		TLM4	
9	Experiment – 9	CO2,CO4	3	12.04.2025		TLM4	
10	Experiment – 10	CO3,CO4	3	19.04.2025		TLM4	
11	Experiment – 11	CO3,CO4	3	26.04.2025		TLM4	
12	Experiment – 12	CO3,CO4	3	26.04.2025		TLM4	
--	Revision Lab	--	3	03.05.2025		TLM4	
	Internal Examination			17.05.2025		TLM4	

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 2nd 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 1st 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 (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work	1,2,3,4,5,6,7,8…	A1 =10
Record and observation	1,2,3,4,5,6,7,8…	B1 = 5
Internal Exam	1,2,3,4,5,6,7,8…	**C1=15**
Cumulative Internal Examination (CIE):(A1+B1+C1)	1,2,3,4,5,6,7,8…	**30**
Semester End Examination (SEE)	1,2,3,4,5,6,7,8…	**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:	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
CH.Mallikharjuna Rao	K.V.Ashok	Dr.T.Satyanarayana	Dr. G. Srinivasulu

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Department of Electronics and Communication Engineering

COURSE HANDOUT

Name of Course Instructor : Mr. Ch. Mallikharjuna Rao
Course Name : Association
Program/Sem/Sec : B.Tech./ECE II-Sem, A-Section A.Y: 2024-2025

COURSE DELIVERY PLAN (LESSON PLAN):

S.No	Topics to be covered	Tentative Date of Completion	Actual Date of Completion	HOD Sign Weekly
1.	Discussion about Association Activities	24.01.2025		
2.	Seminar related to the Surya Ghar scheme.	31.01.2025		
3.	Seminar related to Cloud Computing.	07.02.2025		
4.	Seminar related to 5G Technology.	14.02.2025		
5.	Debate on Artificial Super Intelligence – Pros and cons.	21.02.2025		
6.	Extempore on Atal Tinkering Lab and its activities.	28.02.2025		
7.	Debate on Solar-Powered Irrigation Systems.	07.03.2025		
8.	Group Discussion on India's Energy Evolution: A Shift Towards Renewables.	21.03.2025		
9.	Quiz on current issues – National and international	28.03.2025		
10.	Seminar on E-waste Management	04.04.2025		
11.	Seminar on "Optical Computers The future of technology"	11.04.2025		
12.	Presentation on Cyber Spying.	25.04.2025		
13.	Group Discussion on Wildfire in Los Angeles City USA	02.05.2025		
14.	Group Discussion on "Artificial Intelligence Impact on Employment".	09.05.2025		
15.	Group Discussion on The Trillion-dollar future: A Deep Dive into the Semiconductor Industry's Growth Prospects.	16.05.2025		

Mr. Ch. Mallikharjuna Rao

HOD
Dr. G. Srinivasulu

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DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. V.Parvathi
Course Name & Code :Chemistry & 23FE02
L-T-P Structure :3-0-0 **Credits:03**
Program/Sem/Sec : B.Tech/II sem/ ECE B **A.Y. :**2024-25

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 energydiagrams 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 differentapplications(Understand)
CO4	Outline the importance of polymers and conducting polymers in advancedtechnologies(Understand)
CO5	Understand the fundamentals of UV-Visible, IR spectroscopic techniques and basicprinciples 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, DhanpatRai, 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. Billmayer Jr, 3rd Edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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	1	22-01-2025		TLM1	
2		1	23-01-2025		TLM1	
3		1	24-01-2025		TLM1	
5	Fundamentals Of Quantum Mechanics	1	29-01-2025		TLM1	
6	Fundamentals Of Quantum Mechanics	1	30-01-2025		TLM1	
7	Fundamentals Of Quantum Mechanics	1	31-01-2025		TLM1	
8	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules	1	01-02-2025		TLM1	
9	Practice of examples	1	05-02-2025		TLM1	
10	Practice of examples	1	06-02-2025		TLM1	
11	Energy level diagrams of O_2 and CO	1	07-02-2025		TLM1	
12	Practice of examples	1	08-02-2025		TLM1	
13	π-molecular orbitals of butadiene	1	12-02-2025		TLM1	
14	π-molecular orbitals of benzene	1	13-02-2025		TLM1	
15	Schrodinger Wave Equation & Significance of Ψ and Ψ^2		14-02-2025		TLM1	
16	Particle In one dimensional box	1	15-02-2025		TLM1	
No. of classes required to complete UNIT-I: 16				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	19-02-2025		TLM1	
2.	Semiconductors - Basic concept,	1	20-02-2025		TLM1	
3.	Doping and & applications	1	21-02-2025		TLM1	
4.	Super conductors - Introduction	1	22-02-2025		TLM1	
5.	Super conductors - Basic concept&applications	1	27-02-2025		TLM1	
6.	Supercapacitors - Basic concept-	1	28-02-2025		TLM2	
7.	Classification, Applications of super capacitors	1	01-03-2025		TLM2	
8.	Nano materials - classification	1	05-03-2025		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	06-03-2025		TLM2	
10	Nano materials - carbon nano tubes and graphene nanoparticles	1	07-03-2025		TLM2	
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.	Mid I Analysis	1	19-03-2025		TLM2	
2.	Electrochemical cell and basic concepts of electrochemistry.	1	20-03-2025		TLM1	
3.	Cell potential calculations and numerical problems	1	21-03-2025		TLM1	
4.	Continue...numerical problems.	1	22-03-2025		TLM1	
5.	Continue...numerical problems	1	26-03-2025		TLM1	
6.	Potentiometry-potentiometric titrations (redox titrations)	1	27-03-2025		TLM1	
7.	Concept of conductivity, conductivitycell,conductometric titrations (acid-base titrations)	1	28-03-2025		TLM1	

8.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	29-03-2025		TLM1	
9	Primary cells – Zinc-air battery, Secondary cells – - working of the batteries including cell reactions	1	02--04-2025		TLM1	
10	lithium-ion batteries working of the batteries including cell reactions	1	03-04-2025		TLM1	
11	Fuel cells, hydrogen-oxygen fuel cell– working of the cells, Polymer electrolyte membrane fuel cells (PEMFC)	1	04-04-2025		TLM1	
12	Nernst equation and problems	1	09-04-2025		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	10-04-2025		TLM1	
2.	Thermo and Thermosetting plastics, types of polymerisation with examples.	1	11-04-2025		TLM1	
3.	Mechanisms of addition polymerisation	1	16-04-2025		TLM1	
4.	Mechanism of step growth polymerization.	1	17-04-2025		TLM1	
5.	Mechanism coordination polymerization, with specific example.	1	19-04-2025		TLM1	
6.	Preparation, properties and applications of – PVC, Teflon, Nylon-6,6, carbon fibres	1	23-04-2025		TLM1	
7	Preparation, properties and applications of Bakelite,	1	24-04-2025		TLM1	
8	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	25-04-2025		TLM1	

9	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	26-04-2025		TLM1	
10	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	30-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 10				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	01-05-2025		TLM2	
2.	Absorption of radiation: Beer-Lambert's law	1	02-05-2025		TLM2	
3.	UV-Visible Spectroscopy	1	03-05-2025		TLM2	
4.	electronic transition, Instrumentation	1	07-05-2025		TLM2	
5.	IR spectroscopies, fundamental modes	1	08-05-2025		TLM2	
6.	selection rules, Instrumentation of IR spectroscopy	1	09-05-2025		TLM2	
7.	Applications of IR spectroscopy	1	14-05-2025		TLM2	
8.	Chromatography-Basic Principle	1	14-05-2025		TLM2	
9	Classification-HPLC: Principle, Instrumentation and Applications	1	15-05-2025		TLM2	
10	Cont… chromatography	1	16-05-2025		TLM2	
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.	1	17-05-2025		TLM2	
2	Applications of polymers in advanced technologies .	1	17-05-2025		TLM2	

Teaching Learning Methods

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

PART-C

EVALUATION PROCESS (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 engineeringproblems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics 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 appropriateconsiderationforthepublichealthandsafety,andthecultural,societal,andenviron mentalconsiderations.
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 theinformation to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and 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, beingable to comprehend andwriteeffectivereportsanddesigndocumentation,makeeffectivepresentations,andgivean dreceiveclear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of theengineeringandmanagementprinciplesandapplythesetoone'sownwork,asamemberandle aderinateam, 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. V.Parvathi**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., ECE-B
ACADEMIC YEAR	**:** 2024-25
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.R. Kavitha
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", 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	20-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	21-01-2025		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	22-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	23-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	24-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	27-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	28-01-2025		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	29-01-2025		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	30-01-2025		TLM1	CO1	T1,T2	
10.	TUTORIAL - I	1	31-01-2025		TLM3	CO1	T1,T2	
11.	Non-exact DE Type III	1	03-02-2025		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	04-02-2025		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	05-02-2025		TLM1	CO1	T1,T2	
14.	Newton's Law of cooling	1	06-02-2025		TLM1	CO1	T1,T2	
15.	TUTORIAL - II	1	07-02-2025		TLM3	CO1	T1,T2	
16.	Law of natural growth and decay	1	10-02-2025		TLM1	CO1	T1,T2	
17.	Law of natural growth and decay	1	11-02-2025		TLM1	CO1	T1,T2	
18.	Electrical circuits	1	12-02-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		16			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
19.	Introduction to UNIT II	1	13-02-2025		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	14-02-2025		TLM1	CO1	T1,T2	
21.	Solving a homogeneous DE	1	17-02-2025		TLM1	CO1	T1,T2	
22.	Finding Particular Integral, P.I for e^{ax+b}	1	18-02-2025		TLM1	CO1	T1,T2	
23.	P.I for Cos bx, or sin bx	1	19-02-2025		TLM1	CO1	T1,T2	

24.	P.I for polynomial function	1	20-02-2025		TLM1	CO1	T1,T2	
25.	TUTORIAL - III	1	21-02-2025		TLM3	CO1	T1,T2	
26.	P.I for $e^{ax+b}v(x)$	1	24-02-2025		TLM1	CO1	T1,T2	
27.	P.I for $x^k v(x)$	1	25-02-2025		TLM1	CO1	T1,T2	
28.	Method of Variation of parameters	1	27-02-2025		TLM1	CO1	T1,T2	
29.	TUTORIAL - IV	1	28-02-2025		TLM3	CO1	T1,T2	
30.	Method of Variation of parameters	1	03-03-2025		TLM1	CO1	T1,T2	
31.	Simultaneous linear equations	1	04-03-2025		TLM1	CO1	T1,T2	
32.	L-C-R circuits	1	05-03-2025		TLM1	CO1	T1,T2	
33.	Simple Harmonic motion	1	06-03-2025		TLM1	CO1	T1,T2	
34.	TUTORIAL - V	1	07-03-2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		16			No. of classes taken:			

I MID EXAMINATIONS (10-03-2025 TO 15-03-2025)

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
35.	Introduction to Unit III	1	17-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary constants	1	18-03-2025		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	19-03-2025		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	20-03-2025		TLM1	CO2	T1,T2	
39.	TUTORIAL – VI	1	21-03-2025		TLM3	CO2	T1,T2	
40.	Solving of PDE	1	24-03-2025		TLM1	CO2	T1,T2	
41.	Solving of PDE	1	25-03-2025		TLM1	CO2	T1,T2	
42.	Lagrange's Method	1	26-03-2025		TLM1	CO2	T1,T2	
43.	Lagrange's Method	1	27-03-2025		TLM1	CO2	T1,T2	
44.	TUTORIAL - VII	1	28-03-2025		TLM3	CO2	T1,T2	
45.	Homogeneous Linear PDE with constant coefficients	1	01-04-2025		TLM1	CO2	T1,T2	
46.	Homogeneous Linear PDE with constant coefficients	1	02-04-2025		TLM1	CO2	T1,T2	
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

47.	Introduction to UNIT IV	1	03-04-2025		TLM1	CO3	T1,T2	
48.	Vector Differentiation	1	04-04-2025		TLM1	CO3	T1,T2	
49.	Gradient	1	07-04-2025		TLM1	CO3	T1,T2	
50.	Directional Derivative	1	08-04-2025		TLM1	CO3	T1,T2	
51.	Directional Derivative	1	09-04-2025		TLM1	CO3	T1,T2	
52.	Divergence	1	10-04-2025		TLM1	CO3	T1,T2	
53.	TUTORIAL VIII	1	11-04-2025		TLM3	CO3	T1,T2	
54.	Curl	1	15-04-2025		TLM1	CO3	T1,T2	
55.	Problems	1	16-04-2025		TLM1	CO3	T1,T2	
56.	Solenoidal fields, Irrotational fields, potential surfaces	1	17-04-2025		TLM1	CO3	T1,T2	
57.	Solenoidal fields, Irrotational fields, potential surfaces	1	21-04-2025		TLM1	CO3	T1,T2	
58.	Laplacian, second order operators	1	22-04-2025		TLM1	CO3	T1,T2	
59.	Vector Identities	1	23-04-2025		TLM1	CO3	T1,T2	
60.	Vector Identities	1	24-04-2025		TLM1	CO3	T1,T2	
61.	TUTORIAL IX	1	25-04-2025		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
62.	Introduction to Unit-V	1	28-04-2025		TLM1	CO4	T1,T2	
63.	Line Integral	1	29-04-2025		TLM1	CO4	T1,T2	
64.	Circulation	1	30-04-2025		TLM1	CO4	T1,T2	
65.	Work done	1	01-05-2025		TLM1	CO4	T1,T2	
66.	TUTORIAL - X	1	02-05-2025		TLM3	CO4	T1,T2	
67.	Surface Integral	1	05-05-2025		TLM1	CO4	T1,T2	
68.	Surface Integral	1	06-05-2025		TLM1	CO4	T1,T2	
69.	Flux	1	07-05-2025		TLM1	CO4	T1,T2	
70.	Green's Theorem	1	08-05-2025		TLM1	CO4	T1,T2	
71.	TUTORIAL - XI	1	09-05-2025		TLM3	CO4	T1,T2	
72.	Stoke's Thoerem	1	12-05-2025		TLM1	CO4	T1,T2	
73.	Divergence Theorem	1	13-05-2025		TLM1	CO4	T1,T2	
74.	TUTORIAL - XII	1	16-05-2025		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		13			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
75.	Non-homogeneous Linear PDE with constant coefficients	2	14-05-2025 15-05-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-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	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. T.Radha Rani	**Dr. K.R. Kavitha**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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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., II-Sem., ECE-B **A.Y.:** 2024-25

PREREQUISITE: Building Materials

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	21-01-2025		**TLM2**	
2.	**Basics of Civil Engineering:** Role of Civil Engineers in Society	1	23-01-2025		**TLM2**	
3.	Various Disciplines of Civil Engineering- Structural Engineering-	1	24-01-2025		**TLM2**	
4.	Geo-technical Engineering-Transportation Engineering	1	25-01-2025		**TLM2**	
5.	Hydraulics and Water Resources Engineering	1	28-01-2025		**TLM2**	
6.	Environmental Engineering-Scope of each discipline - Building Construction and Planning-	1	30-01-2025		**TLM2**	
7.	Construction Materials-Cement -types	1	31-01-2025		**TLM2**	
8.	Aggregate types- Bricks-classifications- Steel-properties - types Cement concrete- Applications	1	01-02-2025		**TLM2**	
9.	Introduction to Prefabricated construction Techniques, Over view-Prefabricated construction	1	04-02-2025		**TLM2**	
No. of classes required to complete UNIT-I: 09				**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	06-02-2025		**TLM2**	
2.	Angular Measurements, Compass survey	1	07-02-2025		**TLM2**	
3.	Introduction to Bearings, Simple problems on bearings	1	11-02-2025		**TLM2**	
4.	Levelling introduction-	1	13-02-2025		**TLM2**	
5.	Levelling instruments used for levelling	1	14-02-2025		**TLM2**	
6.	Simple problems on levelling and bearings- problems on levelling	1	15-02-2025		**TLM1**	
7.	Practice problems	1	18-02-2025		**TLM1**	
8.	Contour mapping	1	20-02-2025		**TLM2**	
No. of classes required to complete UNIT-II: 08				**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	21-02-2025		**TLM2**	
2.	Types of Highway Pavements	1	22-02-2025		**TLM2**	
3.	Flexible Pavements - Rigid Pavements Simple Differences	1	25-02-2025		**TLM2**	
4.	Basics of Harbour, Tunnel	1	27-02-2025		**TLM2**	
5.	Basics of Airport, and Railway Engineering	1	28-02-2025		**TLM2**	
6.	**Water Resources and Environmental Engineering** Introduction	1	01-03-2025		**TLM2**	
7.	Sources of water , Quality of water-Specifications	1	04-03-2025		**TLM2**	
8.	Introduction to Hydrology	1	06-03-2025		**TLM2**	
9.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	07-03-2025		**TLM2**	
10.	Simple introduction to Dams and Reservoirs	1	08-03-2025		**TLM2**	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), 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 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	**B RAMA KRISHNA**	**B. Ramakrishna**	**Dr. J. Venkateswara Rao**
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. A. Koteswara Rao
Course Name & Code : Introduction to Programming(23CS01)
L-T-P Structure : 3-0-0 Credits:3
Program/Sem/Sec : B.Tech-ECE/II/B A.Y.:2024-25

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 datatypes, control structures, functions and arrays.
- To encourage collaborative learning and team work 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 algorithm and algorithmic thinking.	Understand–Level 2
CO2:	Analyze a problem and develop an algorithm to solve it.	Analyze – Level4
CO3:	Implement various algorithms using the C programming language.	Apply–Level3
CO4:	Understand more advanced features of C language.	Understand–Level 2
CO5:	Develop problem-solving skills and the ability to debug and optimize the code.	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	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	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-HillEducation, 1996

REFERENCEBOOKS:

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	20-01-2025		TLM2	
2.	History of Computers	1	22-01-2025		TLM2	
3.	Basic organization of a computer: ALU, input-output units.	1	22-01-2025		TLM2	
4.	Memory, program counter, Introduction to Programming Languages,	1	25-01-2025		TLM1, TLM2	
5.	Basics of a Computer Program-Algorithms	1	27-01-2025		TLM1	
6.	Flowcharts (Using Dia Tool), pseudo code.	1	29-01-2025		TLM1	
7.	Introduction to Compilation and Execution	1	29-01-2025		TLM1	
8.	Primitive Data Types	2	01-02-2025 03-02-2025		TLM1	
9.	Variables, and Constants, Basic Input and Output operations	1	05-02-2025		TLM1	
10.	Type Conversion, and Casting	1	05-02-2025		TLM1	
11.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	08-02-2025		TLM1	
12.	Problem solving strategies: Top-down approach, Bottom-up approach	1	10-02-2025		TLM1	
13	Time and space complexities of algorithms.	1	12-02-2025		TLM1	
No. of classes required to complete UNIT–I:14				**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
14.	Simple sequential programs Conditional Statements	1	12-02-2025		TLM1	
15.	if, if-else	1	15-02-2025		TLM1, TLM2	
16.	Else-if ladder, nested if	1	17-02-2025		TLM1, TLM2	
17.	Switch, sample programs on decision making and branching	1	19-02-2025		TLM1, TLM2	
18.	Loops: while , Example programs	1	19-02-2025		TLM1, TLM2	
19.	Loops: do-while, Example programs	1	22-02-2025		TLM1	
20.	Loops: for, Example programs	1	12-02-2025		TLM1	
21.	Nested Loops with examples	1	24-02-2025		TLM1	
22.	Break, Continue, Example programs	1	01-03-2025		TLM1	

23.	Example programs on loops	1	03-03-2025		TLM1	
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	05-03-2025		TLM1, TLM2	
25.	Array indexing, Accessing elements	1	05-03-2025		TLM1, TLM2	
26.	memory model	1	08-03-2025		TLM1, TLM2	
27.	programs with array of integers	1	17-03-2025		TLM1, TLM2	
28.	Introduction to two dimensional arrays	1	19-03-2025		TLM1, TLM2	
29.	2D Array indexing, Accessing elements	1	19-03-2025		TLM1, TLM2	
30.	programs with 2D arrays	1	22-03-2025		TLM1, TLM2	
31.	Introduction to Strings	1	24-03-2025		TLM1, TLM2	
32.	Reading and Writing Operations on Strings	1	26-03-2025		TLM1, TLM2	
33.	String Handling Functions	1	26-03-2025		TLM1, TLM2	
No. of classes required to complete UNIT–III:10				**No. of classes taken:**		

UNIT–IV: Pointers & User Defined Datatypes

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	29-03-2025		TLM1, TLM2	
35.	dereferencing and address operators	1	02-04-2025		TLM1, TLM2	
36.	pointer and address arithmetic	1	02-04-2025		TLM1, TLM2	
37.	array manipulation using pointers	1	07-04-2025		TLM1, TLM2	
38.	Introduction to User-defined data types	1	09-04-2025		TLM1, TLM2	
39.	Structures, Definition and Initialization	1	09-04-2025		TLM1, TLM2	
40.	Example programs	1	12-04-2025		TLM1, TLM2	
41.	Unions, examples	1	16-04-2025		TLM1, TLM2	
42.	Difference between structures & unions	1	19-04-2025		TLM1, TLM2	
43.	Structures and pointers	1	21-04-2025		TLM1, TLM2	
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
44.	Introduction to Functions	1	23-04-2025		TLM1	
45.	Function Declaration and Definition	1	23-04-2025		TLM1, TLM2	
46.	Function call Return Types	1	26-04-2025		TLM1, TLM2	

47.	Function Arguments, types	1	28-04-2025		TLM1, TLM2	
48.	modifying parameters inside functions using pointers	1	30-04-2025		TLM1, TLM2	
49.	Examples on function with pointers	1	03-05-2025		TLM1, TLM2	
50.	arrays as parameters	1	05-05-2025		TLM1, TLM2	
51.	Scope and Lifetime of Variables	1	07-05-2025		TLM1, TLM2	
52.	Introduction to Files	1	07-05-2025		TLM1, TLM2	
53.	Basics of File Handling	1	10-05-2025		TLM1, TLM2	
54.	Operations on Files	1	12-05-2025		TLM1, TLM2	
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
55.	Application Development using C	1	14-05-2025			
56.	Introduction to Data Structures	1	14-05-2025			
57.	Introduction to Data Structures	1	17-05-2025			

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

PART-C

EVALUATION PROCESS (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
MidMarks =80%ofMax((M1+Q1+A1),(M2+Q2+A2))+20%ofMin ((M1+Q1+A1),(M2+Q2+A2))	M=30

Cumulative Internal Examination(CIE):M	30
Semester End Examination(SEE)	70
TotalMarks =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
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	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	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	**A. Koteswara Rao**	**Dr. K. Venkatrao**	**Dr. Y. Vijay Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

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 : 2024-25
Course Name & Code : Network Analysis – 23EC01
L-T-P-Cr Structure : 3-0-0-3
Course Instructor : Mr. K.V. Ashok

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 will be able to

CO 1	Apply fundamental laws and theorems to compute electrical variables of DC circuits (Apply – L3)	L3
CO 2	Analyze electrical networks during transients in the Laplace domain (Apply – L3)	L3
CO 3	Apply fundamental laws and theorems to compute electrical variables of AC electrical circuits (Apply – L3)	L3
CO 4	: 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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO 1	3	3	-	-	-	-	-	-	-	-	-	2	2	1	-
CO 2	3	3	1	-	-	-	-	-	-	-	-	2	3	1	-
CO 3	3	3	1	-	-	-	-	-	-	-	-	2	1	2	-
CO 4	2	3	-	-	-	-	-	-	-	-	-	1	2	2	-
CO5	2	2	-	-	-	-	-	-	-	-	-	2	1	2	-
CO6	2	2	2	-	-	-	-	-	-	-	-	1	1	2	-

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

Textbooks (T) and References (R):

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 th Edition 2020

T3: Network lines and Fields by John. D. Ryder 2 nd Edition, PHI

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)

UNIT-I: Types of circuit components & Circuit Theorems

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.	Types of Sources and Source Transformations	1	20.01.2025		TLM1	
2.	Mesh analysis	1	21.01.2025		TLM1	
3.	Nodal analysis	1	22.01.2025		TLM1	
4.	Mesh analysis, Nodal analysis including dependent sources. Principle of Duality.	1	23.01.2025		TLM1	
5.	Thevenin's Theorems, Norton's Theorems	1	27.01.2025		TLM1	
6.	Milliman's Theorems, Reciprocity.	1	28.01.2025		TLM1	
7.	Compensation, Substitution Theorems	1	29.01.2025		TLM1	
8.	Superposition Theorems.	1	30.01.2025		TLM1	
9.	Max Power Transfer Theorems	1	03.02.2025		TLM1	
10.	Tellegens Theorems	1	04.02.2025		TLM1	
No. of classes required to complete UNIT-I : 10			No. of classes taken :			

UNIT-II: Transients & Laplace transform

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.	First-order differential equations	1	05.02.2025		TLM1	
2.	Definition of time constants, R-L circuit, R- C circuit with DC excitation	1	06.02.2025		TLM1	
3.	Evaluating initial conditions procedure	1	10.02.2025		TLM1	
4.	second order differential equations homogeneous, non-homogenous.	1	11.02.2025		TLM1	
5.	Problem-solving using R-L-C elements with DC excitation	1	12.02.2025		TLM1	
6.	Problem-solving using R-L-C elements with AC excitation	1	13.02.2025		TLM1	

7.	Response as related to s-plane rotation of roots.	1	17.02.2025		TLM1	
8.	Introduction, Laplace transformation		18.02.2025		TLM1	
9.	Basic theorems of Laplace transforms.		19.02.2025		TLM1	
10.	Problem-solving using Laplace transform		20.02.2025		TLM1	
11.	Partial fraction expansion		24.02.2025		TLM1	
12.	Heaviside's expansions		25.02.2025		TLM1	
13.	problem-solving using Laplace transform.		27.02.2025		TLM1	
14.	problem-solving using Laplace transform.		03.03.2025		TLM1	
No. of classes required to complete UNIT-II: 14			**No. of classes taken :**			

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

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.	Impedance concept	1	04.03.2025		TLM1	
2.	phase angle	1	05.03.2025		TLM1	
3.	series R-L, R-C, R-L-C circuits problem solving	1	06.03.2025		TLM1	
4.	series R-L, R-C, R-L-C circuits problem solving	1	17.03.2025		TLM1	
5.	Complex impedance and phasor notation for R-L, R-C, R-L-C	1	18.03.2025		TLM1	
6.	Complex impedance and phasor notation for R-L-C	1	19.03.2025		TLM1	
7.	problem-solving using mesh analysis.	1	20.03.2025		TLM1	
8.	problem-solving using nodal analysis.	1	24.03.2025		TLM1	
9.	Star-Delta conversion	1	25.03.2025		TLM1	
10	Delta-Star conversion, Problem solving using Laplace transforms.	1	26.03.2025		TLM1	
No. of classes required to complete UNIT-III : 10			**No. of classes taken :**			

UNIT-IV : Resonance & Coupled Circuits

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 concept of resonance, Definition of Q, Series resonance	1	27.03.2025		TLM1	
2.	Bandwidth of series resonance	1	01.04.2025		TLM1	
3.	Parallel resonance	1	02.04.2025		TLM1	
4.	general case-resistance present in both branches	1	03.04.2025		TLM1	
5.	Anti-resonance at all frequencies	1	07.04.2025		TLM1	

6.	Self-inductance, Mutual inductance, Coefficient of coupling	1	08.04.2025	TLM1	TLM1	
7.	Analysis of coupled circuits, Natural current.	1	09.04.2025	TLM1	TLM1	
8.	Dot rule of coupled circuits	1	10.04.2025	TLM1	TLM1	
9.	Dot rule of coupled circuits	1	15.04.2025	TLM1	TLM1	
10.	conductively coupled equivalent circuits	1	16.04.2025	TLM1	TLM1	
11.	problem solving	1	17.04.2025	TLM1	TLM1	
12.	problem solving	1	21.04.2025	TLM1	TLM1	

UNIT-V : Two-port Networks & Image and iterative impedances

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.	Z-parameters	1	23.04.2025		TLM1	
2.	Y-parameters	1	24.04.2025		TLM1	
3.	Transmission line parameters	1	28.04.2025		TLM1	
4.	h- parameters	1	29.04.2025		TLM1	
5.	Relationships Between Parameter Set	1	30.042025		TLM1	
6.	Parallel & series connection of two-port networks	1	01.05.2025		TLM1	
7.	cascading of two-port networks	1	05.05.2025		TLM1	
8.	problem-solving using dependent sources also	1	06.05.2025		TLM1	
9.	Image and iterative transfer constants, Insertion loss	1	07.05.2025		TLM1	
10.	Attenuators and pads	1	08.05.2025		TLM1	
11.	Lattice network and its parameters.	1	12.05.2025		TLM1	
12.	Impedance matching networks.	1	13.05.2025		TLM1	
No. of classes required to complete UNIT-V : 12			**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
1.	Graph Theory	1	14.05.2025		TLM2	
2.	Tie set and cut set methods.	1	15.05.2025		TLM2	

Teaching Learning Methods

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

PART-C: EVALUATION PROCESS:

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 (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

Dt:22/01/2025

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mr. K.V. Ashok	CH.Mallikharjuna Rao	Dr.P.Lachi Reddy	Dr. G. Srinivasulu

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Lakshmi V R Babu Syamala & Dr. V. Parvathi
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. :** 2024-25

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	25-01-2025		TLM1	CO1	
2	Explanation of chemicals and glassware	3	01-02-2025		TLM4	CO1	
3.	Preparation of a Bakelite	3	08-02-2025		TLM4	CO2	
4.	Measuring of pH of water sample	3	15-02-2025		TLM4	CO4	
5.	Determination of amount of HCl using standard Na_2CO_3 solution	3	22-02-2025		TLM4	CO1	
6.	Determination of Strength of an acid in Pb-Acid battery	3	01-03-2025		TLM4	CO3	
7.	Estimation of Ferrous Iron by Dichrometry	3	08-03-2025		TLM4	CO1	
8.	Estimation of Ferrous ion by permanganometry	3	22-03-2025		TLM4	CO1	
9.	Estimation of total hardeness of given water sample	3	29-03-2025		TLM4	CO4	
10.	Alkalinity of water sample	3	12-04-2025		TLM4	CO4	
11.	Conductometric titration of strong acid *versus* strong base	3	19-04-2025		TLM4	CO1	
12.	Conductometric titration of weak acid *versus* strong base	3	26-04-2025		TLM4	CO1	
13.	Additional experiment/repeat	3	03-05-2025		TLM4	CO1	
14.	Internal Exam	3	10-05-2025 & 17-05-2025		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

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

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. A. Rami Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. A. Koteswara Rao

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/B A.Y. :2024-25

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	-	-	-	-	-	-	-	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 WEEKLY
		Required as per the schedule	Tentative Date of Completion			
1.	Week1: Familiarization with programming environment	03	20-01-2025		DM5	
2.	Week2: Problem-solving using Algorithms and Flow charts.	03	27-01-2025		DM5	
3.	Week3: Exercise Programs on Variable types and type conversions	03	03-02-2025		DM5	
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03	17-02-2025		DM5	
5.	Week5: Exercise Programs on Branching and logical expressions	03	24-02-2025		DM5	
6.	Week6: Exercise Programs on Loops, while and for loops	03	03-03-2025		DM5	
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03	10-03-2025		DM5	
8.	Week8: Exercise Programs on 2 D arrays, sorting and Strings.	03	17-03-2025		DM5	
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03	24-03-2025		DM5	
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03	07-04-2025		DM5	
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03	21-04-2025		DM5	
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	03	28-04-2025		DM5	
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03	21-04-2025		DM5	
14.	Week 14: Exercise Programs on File handling. Problem Solving ability Test	03	05-05-2025		DM5	
15.	Lab Internal	03	12-06-2025		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

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	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	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	**A. Koteswara Rao**	**Dr. K. Venkatrao**	**Dr. Y. Vijay Bhaskar Reddy**	**Dr. D. Veeraiah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(Autonomous Status Since the Academic Year 2010-11 & Extended up to 2031-32)
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Department of Electronics and Communication Engineering

COURSE HANDOUT

PART-A:

Program : B.Tech., ECE., II-Sem., Section–B
Academic Year : 2024-25
Course Name & Code : NAS Lab – 23EC51
L-T-P-Cr : 0-0-3-
Course Instructure : Mr. K. V. Ashok

Course Objectives:

- 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 will be able to

CO 1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits **(Apply)**
CO 2	Design resonance circuit for given specifications **(Analyze)**
CO 3	Measure time constants of RL & RC circuits **(Apply)**
CO 4	Analyze the 1st and 2nd 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
CO 1	2	2	-	1	2	-	-	-	-	2	1	2	-	1	-
CO 2	2	2	-	1	2	-	-	-	-	2	2	2	-	1	-
CO 3	2	2	-	1	1	-	-	-	-	2	1	2	-	2	-
CO 4	2	3	-	1	2	-	-	-	-	2	1	2	-	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	-	2	-

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

PART-B: COURSE DELIVERY PLAN (LESSON PLAN):

Expt. No	Experiment/s	COs	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
Cycle – I							
1	Introduction to NA Lab experiments, COs, POs and PSOs Experiment – 1	CO1,CO4	3	24.01.25		TLM4	
2	Experiment – 2	CO1,CO4	3	31.01.25		TLM4	
3	Experiment – 3	CO1,CO4	3	07.02.25		TLM4	
4	Experiment – 4	CO1,CO4	3	14.02.25		TLM4	
5	Experiment – 5	CO1,CO4	3	21.03.25		TLM4	
6	Experiment – 6	CO2,CO4	3	28.03.25		TLM4	
Cycle – II							
7	Experiment – 7	CO1,CO4	3	07.03.2025		TLM4	
8	Experiment – 8	CO1,CO4	3	21.03.2025		TLM4	
9	Experiment – 9	CO2,CO4	3	28.03.2025		TLM4	
10	Experiment – 10	CO3,CO4	3	04.04.2025		TLM4	
11	Experiment – 11	CO3,CO4	3	11.04.2025		TLM4	
12	Experiment – 12	CO3,CO4	3	25.04.2025		TLM4	
--	Revision Lab	--	3	02.05.2025		TLM4	
	Internal Examination			09.05.2025		TLM4	

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 2nd 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 1st 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 (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work	1,2,3,4,5,6,7,8…	A1 =10
Record and observation	1,2,3,4,5,6,7,8…	B1 = 5
Internal Exam	1,2,3,4,5,6,7,8…	**C1=15**
Cumulative Internal Examination (CIE):(A1+B1+C1)	1,2,3,4,5,6,7,8…	**30**
Semester End Examination (SEE)	1,2,3,4,5,6,7,8…	**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:	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
K.V.Ashok	K.V.Ashok	Dr.T.Satyanarayana	Dr. G. Srinivasulu

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, ECE-B

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 23ME51

L-T-P STRUCTURE : 0-0-3

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Dr.K.Murahari, Assoc. Professor
Mr.V.Sankararao, Sr. Asst. Professor

COURSE COORDINATOR: Seelam Srinivasa Reddy, Assoc. Professor

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

COURSEOBJECTIVE:

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 (COs)

CO1	Design and model different prototypes in the carpentry trade such as Cross lap joint, Dovetail 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	Lab Manual

COURSE DELIVERYPLAN (LESSONPLAN): 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	21-01-2025		TLM8	-	
2.	Experiment-1	3	28-01-2025		TLM8	R1	
3.	Experiment-2	3	04-02-2025		TLM8	R1	
4.	Experiment-3	3	11-02-2025		TLM8	R1	
5.	Experiment-4	3	18-02-2025		TLM8	R1	
6.	Experiment-5	3	25-02-2025		TLM8	R1	
7.	Experiment-6	3	04-03-2025		TLM8	R1	
I-Mid Examinations (10.03.2025 to 15.03.2025)							
8.	Experiment-7	3	18-03-2025		TLM8	R1	
9.	Experiment-8	3	25-03-2025		TLM8	R1	
10.	Experiment-9	3	01-04-2025		TLM8	R1	
11.	Experiment-10	3	08-04-2025		TLM8	R1	
12.	Additional Experiments	3	15-04-2025		TLM8	R1	
13.	Additional Experiments	3	22-04-2025		TLM8	R1	
14.	Repetition lab	3	29-04-2025		TLM8	R1	
15.	Repetition lab	3	06-05-2025		TLM8	R1	
16.	Lab Internal	3	13-05-2025		TLM6	-	

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	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical's	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	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
TotalMarks: A1+B1+C1+D1	100Marks

Details of Batches: B-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B11	24761A0468-480	13	B21	24761A0468-480	13
B12	24761A0481-493	13	B22	24761A0481-493	13
B13	24761A0494-4A6	13	B23	24761A0494-4A6	13
B14	24761A04A7-4B9	13	B24	24761A04A7-4B9	13
B15	24761A04C0-4D4	15	B25	24761A04C0-4D4	15

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
B11	C1	C2	F1	F2	P1	P2	E1	E2	T1	T2
B12	C2	C1	F2	F1	P2	P1	E2	E1	T2	T1
B13	F1	F2	P1	P2	E1	E2	T1	T2	C1	C2
B14	F2	F1	P2	P1	E2	E1	T2	T1	C2	C1
B15	P1	P2	E1	E2	T1	T2	C1	C2	F1	F2
B21	P2	P1	E2	E1	T2	T1	C2	C1	F2	F1
B22	E1	E2	T1	T2	C1	C2	F1	F2	P1	P2
B23	E2	E1	T2	T1	C2	C1	F2	F1	P2	P1
B24	T1	T2	C1	C2	F1	F2	P1	P2	E1	E2
B25	T2	T1	C2	C1	F2	F1	P2	P1	E2	E1

LISTOF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dovetail Joint	CO1
3.	Fitting-1(F1)-T-**J**oint	CO2
4.	Fitting-2(F2)-V-**J**oint	CO2
5.	Tin Smithy-1(T1)-Conical funnel	CO2
6.	Tin Smithy-2(T2)-Tapered tray	CO2
7.	Plumbing-1(P1)-Pipe Threading practice	CO3
8.	Plumbing-2(P2)-Pipe Layout	CO3
9.	House Wiring-1(E1)–Series and Parallel connection	CO4
10.	HouseWiring-2(E2)–Fluorescent Lamp and Calling Bell Circuit	CO4

NOTIFICATION OF CYCLES:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle 1	1.	Carpentry-1(C1)-CornerBridleJoint	CO1
	2.	Carpentry-2(C2)-Dovetail Joint	CO1
	3.	Fitting-1(F1)-T-**J**oint	CO2
	4.	Fitting-2(F2)-V-**J**oint	CO2
	5.	Tin Smithy-1(T1)-Conical funnel	CO2
Cycle 2	6.	Tin Smithy-2(T2)-Tapered tray	CO2
	7.	Plumbing-1(P1)-Pipe Threading practice	CO3
	8.	Plumbing-2(P2)-PipeLayout	CO3
	9.	House Wiring-1(E1)–Series and Parallel Connection	CO4
	10.	House Wiring-2(E2)–Fluorescent Lamp and Calling bell Circuit	CO4

PART-D

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**
Dr.K.Murahari Mr.V.Sankararao	Mr.S.Srinivasa Reddy	Mr. J.Subba Reddy	Dr. M. B. S Sreekara Reddy

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 FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.VijayaDasaradha
Course Name & Code : Chemistry&23FE02
L-T-P Structure : **3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech/II-Sem/ECE-C **A.Y. :**2024-25

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:

1. Jain and Jain, Engineering Chemistry, 16/e, DhanpatRai, 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. Billmayer Jr, 3rd Edition

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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.	Fundamentals Of Quantum Mechanics	1	20-01-2025		TLM1	
2.	Fundamentals Of Quantum Mechanics	1	22-01-2025		TLM1	
3.	Schrodinger Wave Equation	1	23-01-2025		TLM1	
4.	Significance of Ψ and Ψ^2	1	25-01-2025		TLM2	
5.	Particle In one dimensional box	1	27-01-2025		TLM1	
6.	Molecular Orbital Theory – Bonding in Homo and Hetero nuclear Diatomic Molecules	1	29-01-2025		TLM1	
7.	Energy level diagrams of O_2 and N_2	1	30-01-2025		TLM2	
8.	Energy level diagrams of CO and NO	1	01-02-2025		TLM1	
9.	π-molecular orbitals of butadiene	1	03-02-2025		TLM1	
10.	π-molecular orbitals of benzene	1	05-02-2025		TLM1	
11.	Calculation of Bond order	1	06-02-2025		TLM2	
12.	Practice of Molecular orbital diagrams	1	08-02-2025		TLM1	
13.	Revision	1	10-02-2025		TLM1	
14.	Revision	1	12-02-2025		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	13-02-2025		TLM1	
2.	Semiconductors - Basic concept&applications	1	15-02-2025		TLM1	
3.	Super conductors - Introduction	1	17-02-2025		TLM2	
4.	Super conductors - Basic concept&applications	1	19-02-2025		TLM1	
5.	Supercapacitors - Introduction	1	20-02-2025		TLM1	
6.	Supercapacitors - Basic concept-classification&applications	1	22-02-2025		TLM1	

7.	Nano materials - Introduction	1	24-02-2025		TLM2	
8.	Nano materials - classification	1	27-02-2025		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	01-03-2025&03-03-25		TLM2	
10.	Nano materials - carbon nano tubes and graphine nanoparticles	1	05-03-2025&06-03-25		TLM2	
11.	Revision for Mid-I	1	08-03-2025		TLM1	
No. of classes required to complete UNIT-II: 13				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.	Introduction Electrochemical cell	1	17-03-2025		TLM1	
2.	Nernst equation derivation	1	19-03-2025		TLM1	
3.	Applications of Nernst equation.	1	20-03-2025		TLM1	
4.	Cell potential calculations and numerical problems	1	22-03-2025		TLM1	
5.	Potentiometry-potentiometric titrations (redox titrations)	1	24-03-2025		TLM1	
6.	Concept of conductivity, conductivitycell, conductometric titrations (acid-base titrations)	1	26-03-2025		TLM2	
7.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	27-03-2025		TLM1	
8.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries-working of the batteries including cell reactions	1	29-03-2025&02-04-25		TLM1	
9.	Fuel cells, hydrogen-oxygenfuel cell– working of the cells	1	03-04-2025		TLM2	
10.	PolymerElectrolyte Membrane Fuel cells (PEMFC)	1	07-04-2025		TLM1	
No. of classes required to complete UNIT-III: 11				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	09-04-2025		TLM1	
2.	Chain growth and step growth polymerization.	1	10-04-2025		TLM1	
3.	coordination polymerization, with specific examples.	1	12-04-2025		TLM2	
4.	Mechanisms of polymer formation	1	16-04-2025		TLM1	
5.	Plastics –Thermo and Thermosetting plastics	1	17-04-2025		TLM1	
6.	Preparation, properties and applications of – PVC, Teflon.	1	19-04-2025		TLM2	
7.	Preparation, properties and applications of Bakelite, Nylon-6,6, carbon fibres	1	21-04-2025& 23-04-25		TLM1	
8.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	24-04-2025		TLM1	
9.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	26-04-2025& 28-04-25		TLM1	
10.	Bio-Degradable polymers – Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	30-04-2025		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	01-05-2025		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	03-05-2025		TLM1	
3.	UV-Visible Spectroscopy	1	05-05-2025		TLM1	
4.	electronic transition, Instrumentation	1	07-05-2025&08-05-2025		TLM1	
5.	IR spectroscopies, fundamental modes	1	10-05-2025&12-05-2025		TLM2	
6.	selection rules, Instrumentation	1	14-05-2025		TLM1	

7.	Chromatography-Basic Principle	1	15-05-2025		TLM2	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	15-05-2025		TLM1	
9.	Revision	1	17-05-2025		TLM1	
No. of classes required to complete UNIT-V: 12				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.	1	17-05-2025		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 engineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics 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 considerationforthepublichealthandsafety,andthecultural,societal,andenvironmentalconsiderations.
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 forsustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, beingable to comprehend andwriteeffectivereportsanddesigndocumentation,makeeffectivepresentations,andgiveandreceiveclear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of theengineeringandmanagementprinciplesandapplythesetoone'sownwork,asamemberandleaderinateam, 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.VijayaDasaradha**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING, (AUTONOMOUS)
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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., ECE - C
ACADEMIC YEAR	**:** 2024-25
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. D. VIJAY KUMAR
COURSE COORDINATOR	**:** Dr. K.R. Kavitha
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", 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	20-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	23-01-2025		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	23-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	25-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	27-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	29-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	30-01-2025		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	30-01-2025		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	01-02-2025		TLM3	CO1	T1,T2	
10.	Non-exact DE Type II	1	03-02-2025		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	05-02-2025		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	06-02-2025		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	06-02-2025		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	08-02-2025		TLM3	CO1	T1,T2	
15.	Law of natural growth and decay	1	10-02-2025		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	12-02-2025		TLM1	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	13-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	13-02-2025		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	15-02-2025		TLM1	CO1	T1,T2	
20.	P.I for Cos bx, or sin bx	1	17-02-2025		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	19-02-2025		TLM1	CO1	T1,T2	
22.	P.I for $e^{ax+b}v(x)$	1	20-02-2025		TLM1	CO1	T1,T2	
23.	TUTORIAL - 3	1	20-02-2025		TLM3	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	22-02-2025		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	24-02-2025		TLM1	CO1	T1,T2	

26.	Method of Variation of parameters	1	27-02-2025		TLM1	CO1	T1,T2	
27.	TUTORIAL - 4	1	27-02-2025		TLM3	CO1	T1,T2	
28.	Simultaneous linear equations	1	01-03-2025		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	03-03-2025		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	05-03-2025		TLM1	CO1	T1,T2	
31.	TUTORIAL - 5	1	08-03-2025		TLM3	CO1	T1,T2	
32.	Revision	1	06-03-2025 06 – 03 – 25					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

I MID EXAMINATIONS (10-03-2025 TO 15-03-2025)

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	17-03-2025		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	19-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
38.	Lagrange's Method	1	24-03-2025		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	26-03-2025		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	27-03-2025		TLM1	CO2	T1,T2	
41.	TUTORIAL - 6	1	29-03-2025		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	27-03-2025		TLM1	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	02-04-2025		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	03-04-2025		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	03-04-2025		TLM1	CO3	T1,T2	
46.	TUTORIAL - 7	1	07-04-2025		TLM3	CO3	T1,T2	
47.	Gradient	1	09-04-2025		TLM1	CO3	T1,T2	

48.	Directional Derivative	1	09-04-2025		TLM1	CO3	T1,T2	
49.	Divergence	1	10-04-2025		TLM1	CO3	T1,T2	
50.	TUTORIAL - 8	1	10-04-2025		TLM3	CO3	T1,T2	
51.	Curl	1	16-04-2025		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	17-04-2025		TLM1	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	17-04-2025		TLM1	CO3	T1,T2	
54.	Laplacian, second order operators	1	19-04-2025		TLM1	CO3	T1,T2	
55.	Vector Identities	1	21-04-2025		TLM1	CO3	T1,T2	
56.	Vector Identities	1	23-04-2025		TLM1	CO3	T1,T2	
57.	TUTORIAL - 9	1	26-04-2025		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	24-04-2025		TLM1	CO4	T1,T2	
59.	Line Integral	1	24-04-2025		TLM1	CO4	T1,T2	
60.	Circulation	1	28-04-2025		TLM1	CO4	T1,T2	
61.	Work done	1	30-04-2025		TLM1	CO4	T1,T2	
62.	Surface Integral, Flux	1	01-05-2025		TLM1	CO4	T1,T2	
63.	TUTORIAL - 10	1	01-05-2025		TLM3	CO4	T1,T2	
64.	Volume Integral	1	03-05-2025		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	05-05-2025		TLM1	CO4	T1,T2	
66.	Green's Theorem	1	07-05-2025		TLM1	CO4	T1,T2	
67.	Stoke's Thoerem	1	08-05-2025		TLM1	CO4	T1,T2	
68.	TUTORIAL - 11	1	17-05-2025		TLM3	CO4	T1,T2	
69.	Divergence Theorem	1	08-05-2025		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	12-05-2025		TLM1	CO4	T1,T2	
71.	Revision	1	14-05-2025					
No. of classes required to complete UNIT-V		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
72.	Non-homogeneous Linear PDE with constant coefficients	2	15-05-2025, 15-05-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

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

Dr. D. VIJAY KUMAR	**Dr. K.R. Kavitha**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
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: Mr.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., II-Sem., ECE-C **A.Y.:** 2024-25

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	20-01-2025		**TLM2**	
2.	**Basics of Civil Engineering:** Role of Civil Engineers in Society	1	21-01-2025		**TLM2**	
3.	Various Disciplines of Civil Engineering- Structural Engineering-	1	24-01-2025		**TLM2**	
4.	Geo-technical Engineering-Transportation Engineering	1	25-01-2025		**TLM2**	
5.	Hydraulics and Water Resources Engineering	1	27-01-2025		**TLM2**	
6.	Environmental Engineering-Scope of each discipline - Building Construction and Planning-	1	28-01-2025		**TLM2**	
7.	Construction Materials-Cement -types	1	31-01-2025		**TLM2**	
8.	Aggregate types- Bricks-classifications- Steel-properties - types Cement concrete- Applications	1	01-02-2025		**TLM2**	
9.	Introduction to Prefabricated construction Techniques, Over view-Prefabricated construction	1	03-02-2025		**TLM2**	
No. of classes required to complete UNIT-I: 09				**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	04-02-2025		**TLM2**	
2.	Angular Measurements, Compass survey	1	07-02-2025		**TLM2**	
3.	Introduction to Bearings, Simple problems on bearings	1	10-02-2025		**TLM2**	
4.	Levelling introduction-	1	11-02-2025		**TLM2**	
5.	Levelling instruments used for levelling	1	14-02-2025		**TLM2**	
6.	Simple problems on levelling and bearings- problems on levelling	1	15-02-2025		**TLM1**	
7.	Practice problems	1	17-02-2025		**TLM1**	
8.	Contour mapping	1	18-02-2025		**TLM2**	
No. of classes required to complete UNIT-II: 08				**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	21-02-2025		**TLM2**	
2.	Types of Highway Pavements	1	22-02-2025		**TLM2**	
3.	Flexible Pavements - Rigid Pavements Simple Differences	1	24-02-2025		**TLM2**	
4.	Basics of Harbour, Tunnel	1	25-02-2025		**TLM2**	
5.	Basics of Airport, and Railway Engineering	1	28-02-2025		**TLM2**	
6.	**Water Resources and Environmental Engineering** Introduction	1	01-03-2025		**TLM2**	
7.	Sources of water , Quality of water-Specifications	1	03-03-2025		**TLM2**	
8.	Introduction to Hydrology	1	04-03-2025		**TLM2**	
9.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	07-03-2025		**TLM2**	
10.	Simple introduction to Dams and Reservoirs	1	08-03-2025		**TLM2**	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	Q1=10
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	A2=5
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	M2=15
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), 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 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	**J.Rangaiah**	**B. Ramakrishna**	**Dr. J. Venkateswara Rao**
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)
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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HAND OUT

PART-A

Name of Course Instructor : Dr. K. Venkatrao
Course Name & Code : Introduction to Programming(23CS01)
L-T-P Structure : 3-0-0 Credits:3
Program/Sem/Sec : B.Tech-ECE/II/C A.Y.:2024-25

PRE-REQUISITE: NIL

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 datatypes, control structures, functions and arrays.
- To encourage collaborative learning and team work 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 algorithm and algorithmic thinking.	Understand–Level 2
CO2:	Analyze a problem and develop an algorithm to solve it.	Analyze – Level4
CO3:	Implement various algorithms using the C programming language.	Apply–Level3
CO4:	Understand more advanced features of C language.	Understand–Level 2
CO5:	Develop problem-solving skills and the ability to debug and optimize the code.	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	-	-	-	-	-	-	-	-	-	-	-	1	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO4	3	2	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	3	-	-	-	-	-	-	-	-	-	-	-	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-HillEducation, 1996

REFERENCEBOOKS:

R1: Computing fundamentals and C Programming, Balagurusamy, E., McGraw-HillEducation, 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	H O D Sign Weekly
1.	Discussion of CEO's and CO's	1	21-01-2025		TLM2	
2.	History of Computers	1	22-01-2025		TLM2	
3.	Basic organization of a computer: ALU, input-output units.	1	23-01-2025		TLM2	
4.	Memory, program counter	1	24-01-2025		TLM1, TLM2	
5.	Introduction to Programming Languages,	1	28-01-2025		TLM1, TLM2	
6.	Basics of a Computer Program-Algorithms	1	29-01-2025		TLM1	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	30-01-2025		TLM1	
8.	Introduction to Compilation and Execution	1	31-01-2025		TLM1	
9.	Primitive Data Types	1	04-02-2025		TLM1	
10.	Variables, and Constants, Basic Input and Output operations	1	05-02-2025		TLM1	
11.	Type Conversion, and Casting	1	06-02-2025		TLM1	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	11-02-2025		TLM1	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	12-02-2025		TLM1	
14	Time and space complexities of algorithms.	1	13-02-2025		TLM1	
No.of classes required to complete UNIT–I:14				**No.of classes taken:**		

UNIT–II:ControlStructures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	No.of Classes Required	Tentative Date of Completion
15.	Simple sequential programs Conditional Statements	1	14-02-2025		TLM1	
16.	if, if-else	1	18-02-2025		TLM1, TLM2	
17.	Else-if ladder, nested if	1	19-02-2025		TLM1, TLM2	
18.	Switch, sample programs	1	20-02-2025		TLM1, TLM2	
19.	Example programs on DecisionMaking and Branching	2	21-02-2025		TLM1, TLM2	
20.	Example programs on DecisionMaking and Branching	1	25-02-2025		TLM1, TLM2	
21.	Loops: while , Example programs	1	27-02-2025		TLM1	
22.	Loops: do-while, Example programs	1	28-02-2025		TLM1	
23.	Loops: for, Example programs	1	04-03-2025		TLM1	
24.	Nested Loops with examples	1	05-03-2025		TLM1	

25.	Break , Example programs	1	06-03-2025		TLM1	
26.	Continue, Example programs	1	07-03-2025		TLM1	
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	H O D Sign Weekly
27.	Arrays Introduction, Declaration	1	18-03-2025		TLM1, TLM2	
28.	Array indexing, Accessing elements	1	19-03-2025		TLM1, TLM2	
29.	memory model	1	20-03-2025		TLM1, TLM2	
30.	programs with array of integers	1	21-03-2025		TLM1, TLM2	
31.	Introduction to two dimensional arrays	1	25-03-2025		TLM1, TLM2	
32.	2D Array indexing, Accessing elements	1	26-03-2025		TLM1, TLM2	
33.	programs with 2D arrays	1	27-03-2025		TLM1, TLM2	
34.	Introduction to Strings	1	28-03-2025		TLM1, TLM2	
35.	Reading and Writing Operations on Strings	1	01-04-2025		TLM1, TLM2	
36.	String Handling Functions	1	02-04-2025		TLM1, TLM2	
No.of classes required to complete UNIT–III:10				**No.of classes taken:**		

UNIT–IV:Pointers & User Defined Datatypes

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	H O D Sign Weekly
37	Introduction to Pointers	1	03-04-2025		TLM1, TLM2	
38.	dereferencing and address operators	1	04-04-2025		TLM1, TLM2	
39.	pointer and address arithmetic	1	08-04-2025		TLM1, TLM2	
40.	array manipulation using pointers	1	09-04-2025		TLM1, TLM2	
41	Introduction to User-defined data types	1	10-04-2025		TLM1, TLM2	
42.	Structures , Definition and Initialization	1	11-04-2025		TLM1, TLM2	
43.	Example programs	1	15-04-2025		TLM1, TLM2	
44.	Unions, examples	1	16-04-2025		TLM1, TLM2	
45.	Difference between structures&unions	1	17-04-2025		TLM1, TLM2	
46.	Structures and pointers	1	22-04-2025		TLM1, TLM2	
47.	Revision	1	23-04-2025		TLM1, TLM2	
No.of classes required to complete UNIT–IV:11				**No.of classes taken:**		

UNIT–V: Functions and FileHandling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	H O D Sign Weekly
48.	Introduction to Functions	1	24-04-2025		TLM1	
49.	Function Declaration and Definition	1	25-04-2025		TLM1, TLM2	

50.	Function call Return Types	1	29-04-2025		TLM1, TLM2	
51.	Function Arguments, types	1	30-04-2025		TLM1, TLM2	
52.	modifying parameters inside functions using pointers	1	01-05-2025		TLM1, TLM2	
53.	Examples on function with pointers	1	02-05-2025		TLM1, TLM2	
54.	arrays as parameters	1	06-05-2025		TLM1, TLM2	
55.	Scope and Lifetime of Variables	1	07-05-2025		TLM1, TLM2	
56.	Introduction to Files	1	08-05-2025		TLM1, TLM2	
57.	Basics of File Handling	1	09-05-2025		TLM1, TLM2	
58.	Operations on Files	1	13-05-2025		TLM1, TLM2	
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
59.	Application Development usingC	1	14-05-2025			
60.	Introduction to Data Structures	1	15-05-2025			
61.	Introduction to Data Structures	1	16-05-2025			

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

PART-C

EVALUATION PROCESS (R23 Regulation):

EvaluationTask	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
MidMarks =80%ofMax((M1+Q1+A1),(M2+Q2+A2))+20%ofMin ((M1+Q1+A1),(M2+Q2+A2))	M=30

Cumulative Internal Examination(CIE):M	30
Semester End Examination(SEE)	70
TotalMarks =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
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	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Nameof the Faculty	**Dr.K.Venkatrao**	**Dr.K.Venkatrao**	**Dr.Y.Vijay Bhaskar Reddy**	**Dr.D.Veeraiah**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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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- C A.Y: 2024-25

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	-	-	-	-	-	-	-	-	-	-	-	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	-

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: Circuit fundamentals 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 Course and COs	1	20-01-25			
2.	Introduction to Unit-I	1	21-01-25			
3.	Types of circuit components	1	23-01-25			
4.	Types of Sources and Source Transformations	1	24-01-25			
5.	Mesh analysis and Nodal analysis	1	27-01-25			
6.	Problem Solving with resistances including dependent sources also	1	28-01-25			
7.	Principal of Duality with examples	1	30-01-25			
8.	Thevenin's Theorem	1	31-01-25			
9.	Norton's Theorem	1	03-02-25			
10.	Milliman's Theorem	1	04-02-25			
11.	Reciprocity Theorem	1	06-02-25			
12.	Compensation, Substitution Theorems	1	07-02-25			
13.	Superposition Theorem	1	10-02-25			
14.	Max Power Transfer Theorem	1	11-02-25			
15.	Tellegens Theorem	1	13-02-25			
16.	Problem solving using Dependent sources also	1	14-02-25			
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 constant	1	17-02-25			
18.	R-L circuit with DC excitation	1	18-02-25			
19.	RC circuit with DC excitation	1	20-02-25			
20.	evaluating initial conditions procedure	1	21-02-25			
21.	Second order differential equations, homogeneous, non-homogenous DEs	1	24-02-25			
22.	Problem-solving using R-L-C elements with DC excitation and AC excitation	1	25-02-25			
23.	Response as related to s-plane rotation of roots	1	27-02-25			
24.	Laplace transform: introduction, Laplace transformation, basic theorems	1	28-02-25			

25.	Problem solving using Laplace transform	1	03-03-25			
26.	Partial fraction expansion	1	04-03-25			
27.	Heaviside's expansions	1	06-03-25			
28.	Problem solving using Laplace transform	1	07-03-25			
No. of classes required to complete UNIT-II		12	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
29.	Impedance concept, phase angle	1	17-03-25			
30.	series R-L, R-C, R-LC circuits problem solving	1	18-03-25			
31.	Complex impedance and phasor notation for R-L, R-C, R-L-C	1	20-03-25			
32.	problem solving using mesh and nodal analysis	1	21-03-25			
33.	Star-Delta conversion	1	24-03-25			
34.	Problem solving using Laplace transforms	1	25-03-25			
35.	Problem solving	1	27-03-25			
36.	Problem solving	1	28-03-25			
37.	Problem solving	1	01-04-25			
38.	Problem solving	1	03-04-25			
No. of classes required to completeUNIT-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
39.	Introduction, Definition of Q	1	04-04-25			
40.	Series resonance, Bandwidth of series resonance	1	07-04-25			
41.	Parallel resonance	1	08-04-25			
42.	General case-resistance present in both branches	1	10-04-25			
43.	Anti-resonance at all frequencies	1	11-04-25			
44.	Coupled Circuits: Self-inductance	1	15-04-25			
45.	Mutual inductance, Coefficient of coupling	1	17-05-25			
46.	Analysis of coupled circuits	1	21-04-25			
47.	Natural current, Dot rule of coupled circuits	1	22-04-25			
48.	conductively coupled equivalent circuits-problem solving	1	24-04-25			
49.	Problem Solving	1	25-04-25			
No. of classes required to complete UNIT-IV		11	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
50.	Relationship of two port networks	1	28-04-25			
51.	Z-parameters, Y-parameters	1	29-04-25			
52.	Transmission line parameters, h-parameters	1	01-05-25			
53.	Relationships Between parameter Sets	1	02-05-25			
54.	Parallel & series connection of two port networks	1	05-05-25			
55.	Cascading of two port networks	1	06-05-25			
56.	problem solving using dependent sources also	1	08-05-25			
57.	Image and iterative impedances, Image and iterative transfer constants	1	09-05-25			
58.	Insertion loss, Attenuators and pads.	1	12-05-25			
59.	Lattice network and its parameters	1	13-05-25			
60.	Impedance matching networks	1	15-05-25			
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 & Attenuators	1	16-05-25			

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 & UNIT-III (Half of the Syllabus))	**A1=5**
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	**M1=15**
I-Quiz Examination (Units-I, II & UNIT-III (Half of the Syllabus))	**Q1=10**
Assignment-II (Unit-III (Remaining Half of the Syllabus), IV & V)	**A2=5**
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), IV & V)	**M2=15**
II-Quiz Examination (UNIT-III (Remaining Half of the Syllabus), 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: **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

PO 9: **Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO 10: **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO 11: **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.

PO 12: **Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1: **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: 20-01-25

Course Instructor	Course Coordinator	Module Coordinator	HOD
M.Sambasiva Reddy	Mr.Ch.Mallikarjuna Rao	Dr.T.Satyanarayana	Dr.G.Srinivasulu

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMAN ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha
Course Name & Code **:** Chemistry Lab&23FE52
L-T-P Structure **:0-0-3** **Credits:1**
Program/Sem/Sec : B.Tech/I-sem/ECE-C **A.Y. :**2024-25

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: After completion 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: Determine the cell constant and conductance of solutions. (Apply)
CO5: Analyze organic compounds by using UV-Visible and IR spectroscopy. (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): Section-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 Engineeringchemistry lab	3	22-01-2025		TLM1		
2.	Introduction to Engineeringchemistry lab	3	29-01-2025		TLM4		
3.	Preparation of a Bakelite	3	05-02-2025		TLM4	CO1	
4.	Determination of amount of HCl using standard Na_2CO_3 solution	3	12-02-2025		TLM4	CO1	
5.	Determination of Strength of an acid in Pb-Acid battery	3	19-02-2025		TLM4	CO1	
6.	Estimation of Ferrous Iron by Dichrometry	3	05-03-2025		TLM4	CO1	
7.	Conductometric titration of strong acid vs. strong base	3	19-03-2025		TLM4	CO1	
8.	Conductometric titration of weak acid vs. strong base	3	26-03-2025		TLM4	CO1	
9.	Potentiometry - determination of redox potentials and emfs	3	02-04-2025		TLM4	CO2	
10.	Preparation of nanomaterials by precipitation method	3	09-04-2025		TLM4	CO4	
11.	Verify Lambert-Beer's law	3	16-04-2025		TLM4	CO4	
12.	Wavelength measurement of sample through UV-Visible Spectroscopy	3	23-04-2025		TLM4	CO4	
13.	Identification of simple organic compounds by IR	3	30-04-2025		TLM4	CO4	
14.	Revision	3	07-05-2025		TLM4	CO4	
15.	Internal Exam	3	14-05-2025		TLM4	CO4	
	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):

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 analyze 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 researchmethodsincludingdesignofexperiments,analysisandinterpretationofdata,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 multidisciplinary 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 instructions.
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.
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.VijayaDasaradha**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSEHANDOUT

PART-A

Name of Course Instructor : Dr.K Venkatrao

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. :2024-25

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	-	-	-	-	-	-	-	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		Date of Completion	Delivery Method
		Required as per the schedule	Taken		
1.	Week1: Familiarization with programming environment	03		22-01-2025	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		31-01-2025	DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03		07-02-2025	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		14-02-2025	DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03		21-02-2025	DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03		28-02-2025	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		07-03-2025	DM5
8.	Week8: Exercise Programs on 2 D arrays, sorting and Strings.	03		21-03-2025	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		28-03-2025	DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03		04-04-2025	DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03		11-04-2025	DM5
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	03		25-04-2025	DM5
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03		02-05-2025	DM5
14.	Week 14: Exercise Programs on File handling. Problem Solving ability Test	03		09-05-2025	DM5
15.	Lab Internal	03		16-05-2025	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

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	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	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.K.Venkatrao	Dr.K.Venkatrao	Dr.Y.Vijay Bhaskar Reddy	Dr. D. Veeraiah
Signature				

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Phone: 08659-222933, Fax: 08659-222931
DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. BATTINA NARASIMHA RAO/Dr. K. V. RAMANA

Course Name &	**:** Engineering Workshop & 23ME51	**Regulation**	: R23
L-T-P Structure	**: 0-0-3**	**Credits**	: 1.5
Program/Sem/Sec	**:** B. Tech/II/ECE-C	**A.Y.**	: 2024-25

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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	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		

Textbooks:

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 (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	18-01-2025		TLM4	
2.	Dove Tail Joint	3	25-01-2025		TLM4	
3.	Corner Lap Joint	3	01-02-2025		TLM4	
4.	T-Fitting	3	15-02-2025		TLM4	
5.	V-Fitting	3	22-02-2025		TLM4	
6.	Two Laps in Series and Parallel Connection with One Way Switch	3	01-03-2025		TLM4	
7.	Florescent Lamp and Calling Bell Circuit	3	15-03-2025		TLM4	
	CYCLE-II					
8.	Preparation of Pipe Layout	3	22-03-2025		TLM4	
9.	Pipe Threading	3	29-03-2025		TLM4	
10.	Preparation of Rectangular Tray	3	05-04-2025		TLM4	
11.	Preparation of Open Scoop	3	19-04-2025		TLM4	
12.	Preparation Of S-Hook	3	26-04-2025		TLM4	
13.	Preparation of chisel,	3	03-05-2025		TLM4	
14.	Internal Lab Exam	3	17-05-2025		-----	
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. J V RAO

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Department of Electronics & 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- C A.Y : 2024-25

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 1st and 2nd 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	-	1	-
CO2	2	2	-	1	2	-	-	-	-	2	2	2	-	1	-
CO3	2	2	-	1	1	-	-	-	-	2	1	2	-	2	-
CO4	2	3	-	1	2	-	-	-	-	2	1	2	-	2	-
CO5	2	2	-	1	2	-	-	-	-	2	2	2	-	2	-

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section – C

Expt. No	Experiment/s	COs	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	21-01-25		TLM1	
Cycle – I							
1	Experiment – 1	CO1,CO4	3	28-01-25		TLM4	
2	Experiment – 2	CO1,CO4	3	04-02-25		TLM4	
3	Experiment – 3	CO1,CO4	3	11-02-25		TLM4	
4	Experiment – 4	CO1,CO4	3	18-02-25		TLM4	
5	Experiment – 5	CO1,CO4	3	25-02-25		TLM4	
6	Experiment – 6	CO2,CO4	3	04-03-25		TLM4	
Cycle – II							
7	Experiment – 7	CO1,CO4	3	18-03-25		TLM4	
8	Experiment – 8	CO1,CO4	3	25-03-25		TLM4	
9	Experiment – 9	CO2,CO4	3	01-04-25		TLM4	
10	Experiment – 10	CO3,CO4	3	08-04-25		TLM4	
11	Experiment – 11	CO3,CO4	3	15-04-25		TLM4	
12	Experiment – 12	CO3,CO4	3	22-04-25		TLM4	
13	Experiment beyond the syllabus		3	29-04-25		TLM4	
--	Revision Lab	--	3	06-05-25		TLM4	
	Internal Examination			13-05-25			

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 2nd 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 1st 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:	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9:	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10:	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11:	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12:	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1:	**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

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Course Instructor	Course Coordinator	Module Coordinator	HOD
Mr. M.Sambasiva Reddy	Mr.K.V.Ashok	Dr.T.Satyanarayana	Dr. G.Srinivasulu

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

Name of Course Instructor : M. Sambasiva Reddy
Course Name : Association
Program/Sem/Sec : B.Tech./ECE II-Sem, C-Section A.Y: 2024-2025

COURSE DELIVERY PLAN (LESSON PLAN):

S.No	Topics to be covered	Tentative Date of Completion	Actual Date of Completion	HOD Sign Weekly
1.	Discussion about Association Activities by course instructors, Self-Introduction and motivation.	23-01-2025		
2.	Exploring the "AI Applications in Electronics and Communication".	30-01-2025		
3.	Seminar on "Job opportunities for ECE students in various sectors"	06-02-2025		
4.	Presentation on "Various Space Launch Vehiccles"	13-02-2025		
5.	Group Discussion on Indian government initiative for Youth and support schemes.	20-02-2025		
6.	Seminar on "Li-Fi Technology"	27-02-2025		
7.	Exploring the "IoT Applications in Electronics and Communication".	06-03-2024		
8.	Group Discussion on India's Energy Evolution : A Shift Towards Renewables.	20-03-2025		
9.	Quiz on current issues – National.	27-03-2025		
10.	Exploring ISRO's "SpaDeX Mission"	03-04-2025		
11.	Seminar on "Optical Computers : The future of technology".	10-04-2025		
12.	Presentation on "Cyber Crimes".	17-04-2025		
13.	Group Discussion on 'Climate change performance index - 2024'	24-04-2025		
14.	Seminar on "5G Technology and its applications".	01-05-2025		
15.	Group Discussion on The Trillion-dollar future : A Deep Dive into the Semiconductor Industry's Growth Prospects.	08-05-2025		
16.	Testing knowledge on verbal/quantitative/reasoning/problem solving/logical/etc. skills.	15-05-2025		

Course Instructor
M. Sambasiva Reddy

HOD
Dr. G. Srinivasulu