LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

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

Phone: 08659-222933, **Fax**: 08659-222931

DIVISION OF CHEMISTRY

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

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

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

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

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

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

Textbooks:

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

Reference: Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): EEE-A

UNIT-I: STRUCTURE AND BONDING MODELS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to chemistry course, CO's &PO's & Bridge Course	1	02-02-2026		TLM1	
2.	Fundamentals of Quantum Mechanics	1	03-02-2026		TLM1	
3.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	05-02-2026		TLM1	
4.	Particle in one-dimensional box	1	07-02-2026		TLM1	
5.	Molecular Orbital Theory	1	09-02-2026		TLM1	
6.	Bonding in Homonuclear diatomic molecules-Energy level diagrams (N_2 ,etc)	1	10-02-2026		TLM1	
7.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams (CO, NO, etc.)	2	12-02-2026 & 14-02-2026		TLM1	
8.	Energy level diagrams-Summary	1	16-02-2026		TLM1	
9.	π-molecular orbitals of butadiene	1	17-02-2026		TLM1	
10.	π-molecular orbitals of benzene	1	19-02-2026		TLM1	
11.	Calculation of Bond order	1	21-02-2026		TLM1	
12.	Revision and assignment	1	23-02-2026		TLM1	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Semiconductors – Introduction	1	24-02-2026		TLM1	
2.	Semiconductors - Basic concept & applications	1	26-02-2026		TLM1	
3.	Super conductors – Introduction	1	28-02-2026		TLM1	
4.	Super conductors - Basic concept & applications	1	02-03-2026		TLM1	
5.	Super capacitors - Introduction, Basic concept	1	05-03-2026		TLM1	
6.	Super capacitors - classification & applications	1	07-03-2026		TLM1	
7.	Nano materials – Introduction	1	09-03-2026		TLM2	
8.	Nano materials – classification	1	10-03-2026		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	12-03-2026		TLM2	
10.	Nano materials - carbon nanotubes and graphene nanoparticles	2	14-03-2026 & 16-03-2026		TLM2	
11.	Revision and assignment	1	17-03-2026		TLM1	
No. of classes required to complete UNIT-II: 12				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Electrochemical cell, Nernst equation	1	30-03-2026		TLM1	
2.	Cell potential calculations and numerical problems	2	31-03-2026		TLM1	
3.	Potentiometry- potentiometric titrations (redox titrations)	1	02-04-2026		TLM1	
4.	Concept of conductivity, conductivity cell, conductometric titrations (acid-base titrations)	1	04-04-2026		TLM1	
5.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	06-04-2026		TLM1	

6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries-working of the batteries including cell reactions	2	07-04-2026 & 09-04-2026		TLM1	
7.	Fuel cells, hydrogen-oxygen fuel cell– working of the cells	1	11-04-2026		TLM1	
8.	Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	13-04-2026		TLM1	
9.	Revision and assignment	1	16-04-2026		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	18-04-2026		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	20-04-2026		TLM1	
3.	Mechanisms of polymer formation	1	21-04-2026		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	23-04-2026		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	25-04-2026 & 27-04-2026		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	28-04-2026		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	30-04-2026		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	02-05-2026		TLM1	
9.	Revision and Assignment	2	04-05-2026 & 05-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Electromagnetic spectrum	1	07-05-2026		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	09-05-2026		TLM1	
3.	UV-Visible Spectroscopy	1	11-05-2026		TLM1	
4.	electronic transition, Instrumentation	1	12-05-2026		TLM1	
5.	IR spectroscopy, fundamental modes	1	14-05-2026		TLM1	
6.	selection rules, Instrumentation	1	16-05-2026		TLM1	
7.	Chromatography-Basic Principle	2	01-06-2026 & 02-06-2026		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	2	04-06-2026 & 06-06-2026		TLM1	
9.	Revision and assignment	2	08-06-2026 & 09-06-2026		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.	2	11-06-2026 & 13-06-2026		TLM1	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**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. Y. Subbareddy**	**Dr. V.Parvathi**	**Dr. V.Parvathi**	**Dr. T.Satyanarayana**
Signature				

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DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

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

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

CO1	Understand the fundamentals of quantum mechanics and molecular orbital energy diagrams for molecules. (Understand)
CO2	Summarize the suitability of advanced materials like semiconductors, superconductors, super capacitors and 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, Dhanpat Rai, 2013.
2. Peter Atkins, Julio de Paula and James Keeler, Atkins' Physical Chemistry, 10/e, Oxford University Press, 2010.

Reference: Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): EEE-B

UNIT-I: STRUCTURE AND BONDING MODELS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign Weekly
1.	Bridge course	2	02-02-2026 & 04-02-2026		TLM1	
2.	Introduction to chemistry course, CO's &PO's Fundamentals of Quantum Mechanics	1	06-02-2026		TLM1	
3.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	07-02-2026		TLM1	
4.	Particle In one dimensional box	1	19-02-2026		TLM1	
5.	Molecular Orbital Theory – Bonding in Homonuclear diatomic molecules-Energy level diagrams (N_2 ,etc)	2	11-02-2026 & 13-02-2026		TLM1	
6.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams (CO, NO, etc.)	2	14-02-2026 & 16-02-2026		TLM1	
7.	Energy level diagrams-Summary	1	18-02-2026		TLM1	
8.	π-molecular orbitals of butadiene	1	20-02-2026		TLM1	
9.	π-molecular orbitals ofbenzene	1	21-02-2026		TLM1	
10.	Calculation of Bond order	1	23-02-2026		TLM1	
11.	Revision and assignment	1	25-02-2026		TLM1	
No. of classes required to complete UNIT-I: 14				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign Weekly
1.	Semiconductors - Introduction	1	27-02-2026		TLM1	
2.	Semiconductors - Basic concept & applications	1	28-02-2026		TLM1	
3.	Super conductors - Introduction	1	02-03-2026		TLM1	
4.	Super conductors - Basic concept & applications	1	04-03-2026		TLM1	
5.	Super capacitors - Introduction, Basic concept	1	06-03-2026		TLM1	
6.	Super capacitors - classification & applications	1	07-03-2026		TLM1	
7.	Nano materials - Introduction	1	09-03-2026		TLM2	
8.	Nano materials - classification	1	11-03-2026		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	13-03-2026		TLM2	
10.	Nano materials - carbon nanotubes and graphene nanoparticles	2	14-03-2026 & 16-03-2026		TLM2	
11.	Revision and assignment	2	18-03-2026 & 20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 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.	Electrochemical cell, Nernst equation	1	30-03-2026		TLM1	
2.	Cell potential calculations and numerical problems	2	01-04-2026 & 04-04-2026		TLM1	
3.	Potentiometry-potentiometric titrations (redox titrations)	1	06-04-2026		TLM1	
4.	Concept of conductivity, conductivitycell, conductometric titrations (acid-base titrations)	1	08-04-2026		TLM1	

5.	Electrochemical sensors – potentiometric sensors with examples, amperometric sensors with examples	1	10-04-2026		TLM1	
6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries-working of the batteries including cell reactions	2	11-04-2026 & 13-04-2026		TLM1	
7.	Fuel cells, hydrogen-oxygen fuel cell– working of the cells	1	15-04-2026		TLM1	
8.	Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	17-04-2026		TLM1	
9.	Revision and assignment	2	18-04-2026 & 20-04-2026		TLM1	
No. of classes required to complete UNIT-III: 12				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign Weekly
1.	Introduction to polymers, functionality of monomers	1	22-04-2026		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	24-04-2026		TLM1	
3.	Mechanisms of polymer formation	1	25-04-2026		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	27-04-2026		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	29-04-2026 & 01-05-2026		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	02-05-2026		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	04-05-2026		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	06-05-2026		TLM1	

9.	Revision and assignment	2	08-05-2026 & 09-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign Weekly
1.	Electromagnetic spectrum	1	11-05-2026		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	13-05-2026		TLM1	
3.	UV-Visible Spectroscopy	1	15-05-2026		TLM1	
4.	Electronic transitions, Instrumentation	1	16-05-2026		TLM1	
5.	IR spectroscopies, fundamental modes	1	01-06-2026		TLM1	
6.	selection rules, Instrumentation	1	03-06-2026 05-06-2026		TLM1	
7.	Chromatography-Basic Principle	1	06-06-2026		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	08-06-2026		TLM1	
9.	Revision and assignment	1	10-06-2026		TLM1	
No. of classes required to complete UNIT-V: 09				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HoD Sign Weekly
1.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	2	12-06-2026 & 13-06-2026		TLM1	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**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. D. Mallikharjuna Rao	Dr. V.Parvathi	Dr. V.Parvathi	Dr. T. Satyanarayana
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

FRESHMAN ENGINEERING DEPARTMENT
COURSE HANDOUT
Part-A

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 44nd Edition, Khanna Publishers, New Delhi, 2017.

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	03/02/2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	04/02/2026		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	05/02/2026		TLM1	CO1	T1, T2	
4.	Linear Differential equation	1	06/02/2026		TLM1	CO1	T1, T2	
5.	Bernoulli's DE	1	07/02/2026		TLM1	CO1	T1, T2	
6.	TUTORIAL - 1	1	10/02/2026		TLM1	CO1	T1, T2	
7.	Exact DE	1	11/02/2026		TLM1	CO1	T1, T2	
8.	Non-exact DE Type I	1	12/02/2026		TLM1	CO1	T1, T2	
9.	TUTORIAL - 2	1	13/02/2026		TLM3	CO1	T1, T2	
10.	Non-exact DE Type II	1	17/02/2026		TLM1	CO1	T1, T2	
11.	Non-exact DE Type III	1	18/02/2026		TLM1	CO1	T1, T2	
12.	Non-exact DE Type IV	1	19/02/2026		TLM1	CO1	T1, T2	
13.	Newton's Law of cooling	1	20/02/2026		TLM1	CO1	T1, T2	
14.	Law of natural growth and decay	1	21/02/2026		TLM1	CO1	T1, T2	
15.	TUTORIAL - 3	1	24/02/2026		TLM1	CO1	T1, T2	
16.	Electrical circuits	1	25/02/2026		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	26/02/2026		TLM1	CO1	T1, T2	
18.	Solving a homogeneous DE	1	27/02/2026		TLM1	CO1	T1, T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	28/02/2026		TLM1	CO1	T1, T2	
20.	P.I for Cos bx, or sin bx	1	03/03/2026		TLM1	CO1	T1, T2	
21.	P.I for polynomial function	1	04/03/2026		TLM1	CO1	T1, T2	
22.	P.I for $e^{ax+b}v(x)$	1	05/03/2026		TLM1	CO1	T1, T2	
23.	P.I for $x^k v(x)$	1	06/03/2026		TLM1	CO1	T1, T2	
24.	Method of Variation of parameters	1	07/03/2026		TLM3	CO1	T1, T2	
25.	TUTORIAL - 4	1	10/03/2026		TLM1	CO1	T1, T2	

26.	Method of Variation of parameters	1	11/03/2026		TLM1	CO1	T1, T2	
27.	Simultaneous linear equations	1	12/03/2026		TLM1	CO1	T1, T2	
28.	L-C-R circuits	1	13/03/2026		TLM1	CO1	T1, T2	
29.	TUTORIAL – 5	1	17/03/2026		TLM1	CO1	T1, T2	
30.	Simple Harmonic motion	1	18/03/2026		TLM3	CO1	T1, T2	
31.	Revision	1	20/03/2026					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Introduction to Unit III	1	31/03/2026		TLM1	CO2	T1, T2	
33.	Formation of PDE by elimination of arbitrary constants	1	01/04/2026		TLM1	CO2	T1, T2	
34.	Formation of PDE by elimination of arbitrary functions	1	02/04/2026		TLM1	CO2	T1, T2	
35.	Formation of PDE by elimination of arbitrary functions	1	04/04/2026		TLM1	CO2	T1, T2	
36.	TUTORIAL - 6	1	07/04/2026		TLM1	CO2	T1, T2	
37.	Solving of PDE	1	08/04/2026		TLM1	CO2	T1, T2	
38.	Lagrange's Method	1	09/04/2026		TLM1	CO2	T1, T2	
39.	Homogeneous Linear PDE with constant coefficients	1	10/04/2026		TLM3	CO2	T1, T2	
40.	Homogeneous Linear PDE with constant coefficients	1	15/04/2026		TLM1	CO2	T1, T2	
41.	Homogeneous Linear PDE with constant coefficients	1	16/04/2026		TLM1	CO2	T1, T2	
42.	Homogeneous Linear PDE with constant coefficients	1	18/04/2026		TLM3	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
43.	Introduction to UNIT IV	1	17/04/2026		TLM1	CO3	T1, T2	
44.	Vector Differentiation	1	21/04/2026		TLM1	CO3	T1, T2	
45.	Gradient	1	22/04/2026		TLM1	CO3	T1, T2	
46.	Directional Derivative	1	23/04/2026		TLM1	CO3	T1, T2	
47.	Divergence	1	24/04/2026		TLM1	CO3	T1, T2	

48.	Curl	1	25/04/2026		TLM3	CO3	T1, T2	
49.	TUTORIAL – 7	1	28/04/2026		TLM1	CO3	T1, T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	29/04/2026		TLM1	CO3	T1, T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	30/04/2026		TLM1	CO3	T1, T2	
52.	Laplacian, second order operators	1	01/05/2026		TLM1	CO3	T1, T2	
53.	Vector Identities	1	02/05/2026		TLM3	CO3	T1, T2	
54.	TUTORIAL – 8	1	05/05/2026		TLM1	CO3	T1, T2	
55.	Vector Identities	1	06/05/2026		TLM1	CO3	T1, T2	
56.	Vector Identities	1	08/05/2026		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	07/05/2026		TLM1	CO4	T1, T2	
59.	Line Integral	1	12/05/2026		TLM1	CO4	T1, T2	
60.	Circulation	1	13/05/2026		TLM1	CO4	T1, T2	
61.	Work done	1	14/05/2026		TLM1	CO4	T1, T2	
62.	Surface Integral, Flux	1	15/05/2026		TLM1	CO4	T1, T2	
63.	Volume Integral	1	16/05/2026		TLM3	CO4	T1, T2	
64.	TUTORIAL - 9	1	02/06/2026		TLM1	CO4	T1, T2	
65.	Green's Theorem	1	03/06/2026		TLM1	CO4	T1, T2	
66.	Green's Theorem	1	04/06/2026		TLM1	CO4	T1, T2	
67.	Stoke's Thoerem	1	05/06/2026		TLM1	CO4	T1, T2	
68.	Divergence Theorem	1	06/06/2026		TLM3	CO4	T1, T2	
69.	TUTORIAL - 10	1	09/06/2026		TLM1	CO4	T1, T2	
70.	Divergence Theorem	1	10/06/2026		TLM1	CO4	T1, T2	
71.	Revision	1	11/06/2026					
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	1	12/06/2026		TLM2	CO2	T1, T2	
No. of classes		1			No. of classes taken:			

II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)

Teaching Learning Methods

TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)

TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C
EVALUATION PROCESS (R23 Regulation):

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

Mr.B.Tandava Krishna	**Dr. K.Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr.T.Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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

COURSE HANDOUT

Part-A

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

T1 Dr. B.S. Grewal, "Higher Engineering Mathematics", 44nd Edition, Khanna Publishers, New Delhi, 2017.

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	02/02/2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	03/02/2026		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	04/02/2026		TLM1	CO1	T1, T2	
4.	Linear Differential equation	1	06/02/2026		TLM1	CO1	T1, T2	
5.	Bernoulli's DE	1	07/02/2026		TLM1	CO1	T1, T2	
6.	Exact DE	1	09/02/2026		TLM1	CO1	T1, T2	
7.	TUTORIAL - 1	1	10/02/2026		TLM1	CO1	T1, T2	
8.	Non-exact DE Type I	1	11/02/2026		TLM1	CO1	T1, T2	
9.	Non-exact DE Type II	1	13/02/2026		TLM3	CO1	T1, T2	
10.	Non-exact DE Type III	1	16/02/2026		TLM1	CO1	T1, T2	
11.	TUTORIAL - 2	1	17/02/2026		TLM1	CO1	T1, T2	
12.	Non-exact DE Type IV	1	18/02/2026		TLM1	CO1	T1, T2	
13.	Newton's Law of cooling	1	20/02/2026		TLM1	CO1	T1, T2	
14.	Law of natural growth and decay	1	21/02/2026		TLM1	CO1	T1, T2	
15.	Electrical circuits	1	23/02/2026		TLM1	CO1	T1, T2	
16.	TUTORIAL	1	24/02/2026		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	25/02/2026		TLM1	CO1	T1, T2	
18.	Solving a homogeneous DE	1	27/02/2026		TLM1	CO1	T1, T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	28/02/2026		TLM1	CO1	T1, T2	
20.	P.I for Cos bx, or sin bx	1	02/03/2026		TLM1	CO1	T1, T2	
21.	P.I for polynomial function	1	04/03/2026		TLM1	CO1	T1, T2	
22.	P.I for $e^{ax+b}v(x)$	1	06/03/2026		TLM1	CO1	T1, T2	
23.	P.I for $x^k v(x)$	1	07/03/2026		TLM1	CO1	T1, T2	
24.	Method of Variation of parameters	1	09/03/2026		TLM3	CO1	T1, T2	
25.	TUTORIAL	1	10/03/2026		TLM1	CO1	T1, T2	
26.	Method of Variation of parameters	1	11/03/2026		TLM1	CO1	T1, T2	

27.	Simultaneous linear equations	1	13/03/2026		TLM1	CO1	T1, T2	
28.	L-C-R circuits	1	14/03/2026		TLM1	CO1	T1, T2	
29.	Simple Harmonic motion	1	16/03/2026		TLM1	CO1	T1, T2	
30.	TUTORIAL	1	17/03/2026		TLM3	CO1	T1, T2	
31.	Revision	1	18/03/2026					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Introduction to Unit III	1	20/03/2026		TLM1	CO2	T1, T2	
33.	Formation of PDE by elimination of arbitrary constants	1	30/03/2026		TLM1	CO2	T1, T2	
34.	TUTORIAL - 6	1	31/03/2026		TLM1	CO2	T1, T2	
35.	Formation of PDE by elimination of arbitrary functions	1	01/04/2026		TLM1	CO2	T1, T2	
36.	Formation of PDE by elimination of arbitrary functions	1	04/04/2026		TLM1	CO2	T1, T2	
37.	Solving of PDE	1	06/04/2026		TLM1	CO2	T1, T2	
38.	Lagrange's Method	1	07/04/2026		TLM1	CO2	T1, T2	
39.	Homogeneous Linear PDE with constant coefficients	1	08/04/2026		TLM3	CO2	T1, T2	
40.	Homogeneous Linear PDE with constant coefficients	1	10/04/2026		TLM1	CO2	T1, T2	
41.	Homogeneous Linear PDE with constant coefficients	1	11/04/2026		TLM1	CO2	T1, T2	
42.	Homogeneous Linear PDE with constant coefficients	1	13/04/2026		TLM3	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
43.	Introduction to UNIT IV	1	15/04/2026		TLM1	CO3	T1, T2	
44.	Vector Differentiation	1	17/04/2026		TLM1	CO3	T1, T2	
45.	Gradient	1	18/04/2026		TLM1	CO3	T1, T2	
46.	Directional Derivative	1	20/04/2026		TLM1	CO3	T1, T2	
47.	TUTORIAL	1	21/04/2026		TLM1	CO3	T1, T2	
48.	Curl	1	22/04/2026		TLM3	CO3	T1, T2	

49.	TUTORIAL	1	24/04/2026		TLM1	CO3	T1, T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	25/04/2026		TLM1	CO3	T1, T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	27/04/2026		TLM1	CO3	T1, T2	
52.	TUTORIAL	1	28/04/2026		TLM1	CO3	T1, T2	
53.	Vector Identities	1	28/04/2026		TLM3	CO3	T1, T2	
54.	Laplacian, second order operators	1	29/04/2026		TLM1	CO3	T1, T2	
55.	Vector Identities	1	01/05/2026		TLM1	CO3	T1, T2	
56.	Vector Identities	1	02/05/2026		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	04/05/2026		TLM1	CO4	T1, T2	
59.	Line Integral	1	05/05/2026		TLM1	CO4	T1, T2	
60.	Circulation	1	06/05/2026		TLM1	CO4	T1, T2	
61.	Work done	1	08/05/2026		TLM1	CO4	T1, T2	
62.	Surface Integral, Flux	1	09/05/2026		TLM1	CO4	T1, T2	
63.	Volume Integral	1	11/05/2026		TLM3	CO4	T1, T2	
64.	TUTORIAL - 9	1	12/05/2026		TLM1	CO4	T1, T2	
65.	Green's Theorem	1	13/05/2026		TLM1	CO4	T1, T2	
66.	Green's Theorem	1	15/05/2026		TLM1	CO4	T1, T2	
67.	Stoke's Thoerem	1	16/05/2026		TLM1	CO4	T1, T2	
68.	Stoke's Thoerem	1	01/06/2026		TLM3	CO4	T1, T2	
69.	TUTORIAL - 10	1	02/06/2026		TLM1	CO4	T1, T2	
70.	Divergence Theorem	1	03/06/2026		TLM1	CO4	T1, T2	
71.	Divergence Theorem	1	05/06/2026					
72	Divergence Theorem	1	06/06/2026					
73	Revision	1	08/06/2026					
74	TUTORIAL	1	09/06/2026					
75	Revision	1	10/06/2026					
76	Revision	1	11/06/2026					
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	1	12/06/2026		TLM2	CO2	T1, T2	

No. of classes	1	No. of classes taken:
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)		

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

PART-C
EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10
Assignment-II (Unit-III, IV & V)	A2=5
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
II-Quiz Examination (UNIT-III, IV & V)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE):	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 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 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.A.Rami Reddy	**Dr. K.Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr.T.Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING (EEE)

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. L. Prabhu
Course Name & Code **:** BC&ME, 23CM01
L-T-P Structure **: 5-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/II-Sem/**A-Sec** **A.Y.: 2025-26**
PREREQUISITE: NO

COURSE EDUCATIONAL OBJECTIVES (CEOs): The students after completing the course are expected to

- Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.
- Explain different engineering materials and different manufacturing processes.
- Provide an overview of different thermal and mechanical transmission systems and introduction basic of robotics and its applications.

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

CO1	Summarize the different manufacturing processes. (Remember-L1)
CO2	Explain the basics of thermal engineering and its applications. (Understand-L2)
CO3	Illustrate the working of different mechanical power transmission systems and power plants (Understand-L2)
CO4	Describe the basics of robotics and its applications (Understand-L2)

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

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

TEXTBOOKS:

T1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

T2. A text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

T3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

REFERENCE BOOKS:

R1. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

R2. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

R3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications

R4. Appu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

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 Mechanical Engineering	1	03-02-26		TLM2	
2.	Role of Mechanical Engineering in Industries and Society	1	04-02-26		TLM2	
3.	Technologies in different sectors such as Energy	1	06-02-26		TLM2	
4.	Technologies in different sectors such as Manufacturing / Automotive	1	07-02-26		TLM2	
5.	Technologies in different sectors such as Aerospace, and Marine sectors	1	10-02-26		TLM2	
6.	Engineering Materials - Metals	1	11-02-26		TLM2	
7.	Types of Metals	1	13-02-26		TLM2	
8.	Smart Materials	1	17-02-26		TLM2	
No. of classes required to complete UNIT-I: 8				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Manufacturing Processes, Principles of Casting	1	18-02-26		TLM2	
10.	Forming, joining processes	1	20-02-26		TLM2	
11.	Introduction to CNC machines	1	21-02-26		TLM2	
12.	3D printing, and Smart manufacturing	1	24-02-26		TLM2	
13.	Thermal Engineering- Working principle of Boilers	1	25-02-26		TLM2	
14.	Otto cycle, Diesel cycle	1	27-02-26		TLM2	
15.	Refrigeration and air-conditioning cycles	1	28-02-26		TLM2	
16.	IC engines, 2-Stroke and 4-Stroke engines, EV, Hybrid	1	04-03-26		TLM2	
No. of classes required to complete UNIT-II: 8				No. of classes taken:		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Power plants – Working principle of Steam power plants	1	06-03-26		TLM2	
18.	Power plants – Working principle of Diesel power plants	1	07-03-26		TLM2	

19.	Power plants – Working principle of Hydro power plants	1	10-03-26		TLM2	
20.	Power plants – Working principle of nuclear power plants	1	11-03-26		TLM2	
21.	Mechanical Power Transmission - Belt Drives	1	13-03-26		TLM2	
22.	Chain, Rope drives,	1	17-03-26		TLM2	
22.	Gear Drives and their applications		18-03-26		TLM2	
24.	Introduction to Robotics- Joints & links, Application of robotics	1	21-03-26		TLM2	
I-Mid Exams			23-03-2026 To 28-03-2026			
No. of classes required to complete UNIT-III: 08				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 (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society
PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work

PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products
PSO 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 Instructor	Course Coordinator	Module Coordinator	HOD
Dr. L. Prabhu			Dr. P. Lovaraju

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING (EEE)

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. kK. Sai Babu
Course Name & Code **:** BC&ME, 23CM01
L-T-P Structure **: 5-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/II-Sem/**B-Sec** **A.Y.: 2025-26**
PREREQUISITE: NO

COURSE EDUCATIONAL OBJECTIVES (CEOs): The students after completing the course are expected to

- Get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries.
- Explain different engineering materials and different manufacturing processes.
- Provide an overview of different thermal and mechanical transmission systems and introduction basic of robotics and its applications.

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

CO1	Summarize the different manufacturing processes. (Remember-L1)
CO2	Explain the basics of thermal engineering and its applications. (Understand-L2)
CO3	Illustrate the working of different mechanical power transmission systems and power plants (Understand-L2)
CO4	Describe the basics of robotics and its applications (Understand-L2)

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

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

TEXTBOOKS:

T1. Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

T2. A text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd.

T3. An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd.

REFERENCE BOOKS:

R1. G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

R2. Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

R3. 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications

R4. Appu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

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 Mechanical Engineering	1	02-02-26		TLM2	
2.	Role of Mechanical Engineering in Industries and Society	1	05-02-26		TLM2	
3.	Technologies in different sectors such as Energy	1	06-02-26		TLM2	
4.	Technologies in different sectors such as Manufacturing / Automotive	1	07-02-26		TLM2	
5.	Technologies in different sectors such as Aerospace, and Marine sectors	1	09-02-26		TLM2	
6.	Engineering Materials - Metals	1	12-02-26		TLM2	
7.	Types of Metals	1	13-02-26		TLM2	
8.	Smart Materials	1	14-02-26		TLM2	
No. of classes required to complete UNIT-I: 8				No. of classes taken:		

UNIT-II:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
9.	Manufacturing Processes, Principles of Casting	1	16-02-26		TLM2	
10.	Forming, joining processes	1	19-02-26		TLM2	
11.	Introduction to CNC machines	1	20-02-26		TLM2	
12.	3D printing, and Smart manufacturing	1	21-02-26		TLM2	
13.	Thermal Engineering- Working principle of Boilers	1	23-02-26		TLM2	
14.	Otto cycle, Diesel cycle	1	26-02-26		TLM2	
15.	Refrigeration and air-conditioning cycles	1	27-02-26		TLM2	
16.	IC engines, 2-Stroke and 4-Stroke engines, EV, Hybrid	1	28-02-26		TLM2	
No. of classes required to complete UNIT-II: 8				No. of classes taken:		

UNIT-III:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Power plants – Working principle of Steam power plants	1	02-03-26		TLM2	
18.	Power plants – Working principle of Diesel power plants	1	05-03-26		TLM2	

19.	Power plants – Working principle of Hydro power plants	1	06-03-26		TLM2	
20.	Power plants – Working principle of nuclear power plants	1	07-03-26		TLM2	
21.	Mechanical Power Transmission - Belt Drives	1	09-03-26		TLM2	
22.	Chain, Rope drives,	1	12-03-26		TLM2	
23.	Gear Drives and their applications	1	13-03-26		TLM2	
24.	Introduction to Robotics- Joints & links	1	14-03-26		TLM2	
25.	Configurations	1	16-03-26		TLM2	
26.	Application of robotics	1	20-03-26		TLM2	
I-Mid Exams			23-03-2026 To 28-03-2026			
No. of classes required to complete UNIT-III: 08				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 &III)	A1=5
I-Descriptive Examination (Units-I, II &III)	M1=15
I-Quiz Examination (Units-I, II &III)	Q1=10
Assignment-II (Unit- IV, V& VI)	A2=5
II- Descriptive Examination (UNIT- IV, V& VI)	M2=15
II-Quiz Examination (UNIT- IV, V& VI)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge
PO 2	Problem analysis
PO 3	Design/development of solutions
PO 4	Conduct investigations of complex problems
PO 5	Modern tool usage
PO 6	The engineer and society

PO 7	Environment and sustainability
PO 8	Ethics
PO 9	Individual and team work
PO 10	Communication
PO 11	Project management and finance
PO 12	Life-long learning

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO 2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products
PSO 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 Instructor	Course Coordinator	Module Coordinator	HOD
Mr. K.Sai Babu	Dr. CH.SSB	Dr. PVK	Dr. MBSS Reddy

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

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

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 data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, the concept of algorithm and algorithmic thinking.	Understand – Level 2
CO2:	Analyze a problem and develop an algorithm to solve it.	Analyze – Level 4
CO3:	Implement various algorithms using the C programming language.	Apply – Level 3
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 – Level 3

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

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

TEXTBOOKS:

T1: The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988dition, 2015

T2: Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

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

R2: Programming in C, Reema Thareja, Oxford, 2016, 2nd edition

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Programming and Problem Solving

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Discussion of CEO's and CO's	1	02-02-2026		TLM2	
2.	History of Computers	1	03-02-2026		TLM2	
3.	Basic organization of a computer: ALU, input-output units.	2	06-02-2026 07-02-2026		TLM2	
4.	Memory, program counter	1	09-02-2026		TLM2	
5.	Introduction to Programming Languages,	1	10-02-2026		TLM2	
6.	Basics of a Computer Program-Algorithms	1	13-02-2026		TLM2	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	14-02-2026		TLM2	
8.	Introduction to Compilation and Execution	1	16-02-2026		TLM2	
9.	Primitive Data Types	2	17-02-2026 20-02-2026		TLM2	
10.	Variables, and Constants, Basic Input and Output operations	1	21-02-2026		TLM2	
11.	Type Conversion, and Casting	1	23-02-2026		TLM2	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	24-02-2026		TLM2	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	27-02-2026		TLM2	
14	Time and space complexities of algorithms.	1	28-02-2026		TLM2	
No. of classes required to complete UNIT – I: 15				**No. of classes taken:**		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Simple sequential programs Conditional Statements	1	28-02-2026		TLM2	
16.	if, if-else	1	02-03-2026		TLM2	
17.	switch	1	06-03-2026		TLM2	
18.	Example programs on Decision Making and Branching	1	07-03-2026		TLM2	
19.	Loops: while , Example programs	2	09-03-2026 10-03-2026		TLM2	
20.	do-while, for, Example programs	2	13-03-2026 14-03-2026		TLM2	
21.	on Loops	1	16-03-2026		TLM2	
22.	Break and Continue	1	17-03-2026		TLM2	
23.	Example programs on Loops	1	21-03-2026		TLM2	
No. of classes required to complete UNIT – II: 11				**No. of classes taken:**		

UNIT – III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Arrays Introduction, Declaration	1	30-03-2026		TLM2	
25.	Array indexing, Accessing elements	1	31-03-2026		TLM2	
26.	memory model	1	04-04-2026		TLM2	
27.	programs with array of integers	1	06-04-2026		TLM2	
28.	Introduction to two dimensional arrays	1	07-04-2026		TLM2	
29.	2D Array indexing, Accessing elements	1	10-04-2026		TLM2	
30.	programs with 2D arrays	1	11-04-2026		TLM2	
31.	Introduction to Strings	1	13-04-2026		TLM2	
32.	Reading and Writing Operations on Strings	1	17-04-2026		TLM2	
33.	String Handling Functions	1	18-04-2026		TLM2	
34.	Example Programs using Strings	1	20-04-2026		TLM2	
No. of classes required to complete UNIT – III: 11				**No. of classes taken:**		

UNIT – IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to Pointers	1	21-04-2026		TLM2	
36.	dereferencing and address operators	1	24-04-2026		TLM2	
37.	pointer and address arithmetic	1	25-04-2026		TLM2	
38.	array manipulation using pointers	2	27-04-2026 28-04-2026		TLM2	
39.	User-defined data types	1	01-05-2026		TLM2	
40.	Structures , Definition and Initialization	2	02-05-2026 04-05-2026		TLM2	
41.	Example programs	1	05-05-2026		TLM2	
42.	Unions	2	08-05-2026 09-05-2026		TLM2	
43.	Example programs	1	11-05-2026		TLM2	
				No. of classes taken:		

UNIT – V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Introduction to Functions	1	12-05-2026		TLM2	
45.	Function Declaration and Definition	1	15-05-2026		TLM2	
46.	Function call Return Types	1	16-05-2026		TLM2	
47.	Arguments	1	01-06-2026		TLM2	
48.	modifying parameters inside functions using pointers	2	02-06-2026 05-06-2026		TLM2	
49.	arrays as parameters	1	06-06-2026		TLM2	
50.	Scope and Lifetime of Variables	1	08-06-2026		TLM2	

51.	Introduction to Files	1	09-06-2026		TLM2	
52.	Basics of File Handling	1	12-06-2026		TLM2	
53.	Operations on Files	1	13-06-2026		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
54.	Introduction to Data Structures	1	13-06-2026		TLM2	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. B. Pangedaiah**	**Dr. B. Srinivasarao**	**Dr. B. Srinivasarao**	**Dr. P.Sobharani**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

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

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 data types, control structures, functions, and arrays.
- To encourage collaborative learning and teamwork in coding projects

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

CO1:	Understand basics of computers, the concept of algorithm and algorithmic thinking.	Understand – Level 2
CO2:	Analyze a problem and develop an algorithm to solve it.	Analyze – Level 4
CO3:	Implement various algorithms using the C programming language.	Apply – Level 3
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 – Level 3

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

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

TEXTBOOKS:

T1: The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 1988dition, 2015

T2: Schaum's Outline of Programming with C, Byron S Gottfried, McGraw-Hill Education, 1996

REFERENCE BOOKS:

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

R2: Programming in C, Reema Thareja, Oxford, 2016, 2nd edition

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Programming and Problem Solving

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Discussion of CEO's and CO's	1	02-02-2026		TLM2	
2.	History of Computers	1	04-02-2026		TLM2	
3.	Basic organization of a computer: ALU, input-output units.	2	05-02-2026 06-02-2026		TLM2	
4.	Memory, program counter	1	09-02-2026		TLM2	
5.	Introduction to Programming Languages,	1	11-02-2026		TLM2	
6.	Basics of a Computer Program-Algorithms	1	12-02-2026		TLM2	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	13-02-2026		TLM2	
8.	Introduction to Compilation and Execution	1	16-02-2026		TLM2	
9.	Primitive Data Types	2	18-02-2026 19-02-2026		TLM2	
10.	Variables, and Constants, Basic Input and Output operations	1	20-02-2026		TLM2	
11.	Type Conversion, and Casting	1	23-02-2026		TLM2	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	25-02-2026		TLM2	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	26-02-2026		TLM2	
14	Time and space complexities of algorithms.	1	27-02-2026		TLM2	
No. of classes required to complete UNIT – I: 15				**No. of classes taken:**		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Simple sequential programs Conditional Statements	1	27-02-2026		TLM2	
16.	if, if-else	1	02-03-2026		TLM2	
17.	switch	1	04-03-2026		TLM2	
18.	Example programs on Decision Making and Branching	1	05-03-2026		TLM2	
19.	Loops: while , Example programs	2	06-03-2026 09-03-2026		TLM2	
20.	do-while, for, Example programs	2	11-03-2026 12-03-2026		TLM2	
21.	on Loops	1	13-03-2026		TLM2	
22.	Break and Continue	1	16-03-2026		TLM2	
23.	Example programs on Loops	1	18-03-2026		TLM2	
No. of classes required to complete UNIT – II: 11				**No. of classes taken:**		

UNIT – III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Arrays Introduction, Declaration	1	30-03-2026		TLM2	
25.	Array indexing, Accessing elements	1	01-04-2026		TLM2	
26.	memory model	1	02-04-2026		TLM2	
27.	programs with array of integers	1	06-04-2026		TLM2	
28.	Introduction to two dimensional arrays	1	08-04-2026		TLM2	
29.	2D Array indexing, Accessing elements	1	09-04-2026		TLM2	
30.	programs with 2D arrays	1	10-04-2026		TLM2	
31.	Introduction to Strings	1	13-04-2026		TLM2	
32.	Reading and Writing Operations on Strings	1	15-04-2026		TLM2	
33.	String Handling Functions	1	16-04-2026		TLM2	
34.	Example Programs using Strings	1	17-04-2026		TLM2	
No. of classes required to complete UNIT – III: 11				**No. of classes taken:**		

UNIT – IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to Pointers	1	20-04-2026		TLM2	
36.	dereferencing and address operators	1	22-04-2026		TLM2	
37.	pointer and address arithmetic	1	23-04-2026		TLM2	
38.	array manipulation using pointers	2	24-04-2026 27-04-2026		TLM2	
39.	User-defined data types	1	29-04-2026		TLM2	
40.	Structures , Definition and Initialization	2	30-04-2026 01-05-2026		TLM2	
41.	Example programs	1	04-05-2026		TLM2	
42.	Unions	2	06-05-2026 07-05-2026		TLM2	
43.	Example programs	1	08-05-2026		TLM2	
				No. of classes taken:		

UNIT – V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Introduction to Functions	1	11-05-2026		TLM2	
45.	Function Declaration and Definition	1	13-05-2026		TLM2	
46.	Function call Return Types	1	14-05-2026		TLM2	
47.	Arguments	1	15-05-2026		TLM2	
48.	modifying parameters inside functions using pointers	2	01-06-2026 03-06-2026		TLM2	
49.	arrays as parameters	1	04-06-2026		TLM2	
50.	Scope and Lifetime of Variables	1	05-06-2026		TLM2	

51.	Introduction to Files	1	08-06-2026		TLM2	
52.	Basics of File Handling	1	10-06-2026		TLM2	
53.	Operations on Files	1	11-06-2026		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
54.	Introduction to Data Structures	1	12-06-2026		TLM2	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. B. Pangedaiah**	**Dr. B. Srinivasarao**	**Dr. B. Srinivasarao**	**Dr. P.Sobharani**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF EEE

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr J.Sivavara Prasad
Course Name & Code: **ELECTRICALCIRCUIT ANALYSIS-I (23EE02)**
L-T-P Structure **:** 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech /II/A **A.Y.: 2025-26**
PREREQUISITE: NIL
COURSE EDUCATIONAL OBJECTIVES (CEOs): To develop an understanding of the fundamental laws, elements of electrical circuits and to apply circuit analysis to DC and AC circuits.
COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand various circuit elements and network reduction techniques
CO2	Compute variables associated with magnetic circuits
CO3	Apply fundamental laws to compute electrical variables in DC&AC circuits
CO4	Analyze resonance circuits and construct locus diagrams
CO5	Apply circuit theorems to compute electrical variables in DC&AC circuits

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

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2													
CO2	3	2										1	3	2		2
CO3	3	2	3									1	3	2		2
CO4	2	2	2										2			
CO5	3	2	3										2			
1 - Low					**2** –Medium								**3** - High			

Textbooks:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata McGraw Hill Education, 2005, sixth edition.
2. Network Analysis, M.E.VanValkenburg, Pearson Education, 2019, Revised Third Edition

ReferenceBooks:

1. Fundamentals of Electrical Circuits, CharlesK. Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India),2013, Fifth Edition
2. Electric Circuits (Schaum's outline Series),Mahmood Nahvi, Joseph Edminister, and K.Rao, McGraw Hill Education, 2017, Fifth Edition.
3. Electric Circuits, David A.Bell, Oxford University Press, 2009, Seventh Edition.
4. Introductory Circuit Analysis, RobertL Boylestad, Pearson Publications, 2023, Fourteenth Edition.
5. Circuit Theory: Analysis and Synthesis, A.Chakrabarti, Dhanpat Rai & Co., 2018, Seventh Revised Edition.

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc23_ee81/preview
2. https://nptel.ac.in/courses/108104139
3. https://nptel.ac.in/courses/108106172 4. https://nptel.ac.in/courses/117106108

PART-B

COURSE DELIVERY PLAN (LESSON PLAN-A/Sec)

(Commencement of Class work w.e.f. 2-2-2026)

UNIT-I: INTRODUCTION TO ELECTRICAL 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.	**OBE & Introduction to EC-I course**	1	03-2-2026		TLM1/2	
2.	Basic Concepts of passive elements of R, L, C and their V-I relations	1	04-2-2026		TLM1/2	
3.	Sources (dependent and independent)	1	05-2-2026		TLM1/2	
4.	Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel, star-to-delta and delta-to-star transformation)	2	07-2-2026 10-2-2026		TLM1/2	
5.	**Tutorial-1**	**1**	**11-2-2026**		**TLM3**	
6.	Source transformation technique	1	12-2-2026		TLM1/2	
7.	Nodal analysis to DC networks with dependent and independent voltage and current sources	**2**	17-2-2026 18-2-2026		TLM1/2	
8.	Mesh analysis to DC networks with dependent and independent voltage and current sources	1	19-2-2026		TLM1/2,	
9.	**Additional Problems**	**2**	21-2-2026 24-2-2026		**TLM1**	
11.	**Tutorial-2**	**1**	**25-2-2026**		**TLM3**	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: MAGNETIC 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
12.	Basic definition of MMF, flux and reluctance, Analogy between electrical and magnetic circuits	1	26-2-2026		TLM1/2	
13.	Faraday's laws of electromagnetic induction – concept of self and mutual inductance,	2	28-2-2026 04-3-2026		TLM1/2	
14.	Dot convention – coefficient of coupling and composite magnetic circuit	2	05-3-2026 07-3-2026		TLM1/2	

15.	**Tutorial-4**	**1**	**10-3-2026**		**TLM3**	
16.	Analysis of series and parallel magnetic circuits	**2**	11-3-2026 12-3-2026		**TLM1/2**	
17.	**Tutorial-3**	**1**	**17-3-2026**		**TLM3**	
18.	**Additional Problems**	**1**	18-3-2026		**TLM1**	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: SINGLE PHASE 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**
19.	Characteristics of periodic functions, Average value, R.M.S. value, form factor	2	31-3-2026 01-4-2026		TLM1/2/3	
20.	**Tutorial-5**	**1**	**02-4-2026**		**TLM3**	
21.	Representation of a sine function, concept of phasor, phasor diagrams	1	04-4-2026		TLM1/2	
22.	Node and mesh analysis. Steady state analysis of R, L and C circuits to sinusoidal excitations	1	07-4-2026		TLM1/2	
23.	Response of pure resistance, inductance, capacitance	1	08-4-2026		TLM1/2	
24.	Series RL circuit, series RC circuit, series RLC circuit	1	09-4-2026		TLM1/2	
	Parallel RL circuit, parallel RC circuit.	2	15-4-2026 16-4-2026		TLM1/2	
25.	**Tutorial-6**	**1**	**18-4-2026**		**TLM3**	
26.	**Additional Problems**	**1**	21-4-2026		**TLM1**	
27.	**Quiz-2**	**1**	22-4-2026		**TLM1/2**	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: RESONANCE AND LOCUS DIAGRAMS

S. No.	**Topics to be covered**	**No. of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign Weekly**
29.	Series Resonance: Characteristics of a series resonant circuit	1	23-4-2026		TLM1/2	

30.	Q-factor, selectivity and bandwidth, expression for half power frequencies	1	25-4-2026		TLM1/2	
	Parallel resonance,:Q-factor, selectivity and bandwidth	1	28-4-2026		TLM1/2	
31.	**Tutorial-7**	**1**	**29-4-2026**		**TLM3**	
32.	Locus diagram: RL, RC, RLC with R, L and C variables.	**2**	30-4-2026 02-5-2026		TLM1/2	
33.	**Tutorial-8**	**1**	**05-5-2026**		**TLM3**	
34.	**Additional Problems**	**2**	06-5-2026 **07-5-2026**		**TLM1**	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: NETWORK THEOREMS (DC & AC EXCITATIONS)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Superposition theorem	1	12-5-2026		TLM1/2	
37.	Thevenin's theorem	1	13-5-2026		TLM1/2	
38.	Norton's theorem	**1**	14-5-2026		TLM1/2	
39.	**Tutorial-9**	**1**	**16-5-2026**		**TLM3**	
40.	Maximum Power Transfer theorem	1	02-6-2026		TLM1/2	
41.	Reciprocity theorem	1	03-6-2026		TLM1/2	
42.	Millman's theorem and compensation theorem	2	04-6-2026 06-6-2026		TLM1/2	
43.	**Additional Problems**	**1**	09-6-2026		TLM1/2	
44.	**Tutorial-10**	1	**10-6-2026**		TLM3	
45.	Old Papers discussion	**1**	11-6-2026		**TLM1/3**	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation)

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	D1=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): D+Q+A	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs)

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs)

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

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	Dr.J.Sivavara Prasad	Dr.J.Sivavara Prasad	Dr.J.S.V.Prasad	Dr.P.Sobha Rani
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF EEE

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr J.Sivavara Prasad
Course Name & Code: **ELECTRICALCIRCUIT ANALYSIS-I (23EE02)**
L-T-P Structure **:** 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech /II/B **A.Y.: 2025-26**
PREREQUISITE: NIL
COURSE EDUCATIONAL OBJECTIVES (CEOs): To develop an understanding of the fundamental laws, elements of electrical circuits and to apply circuit analysis to DC and AC circuits.
COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand various circuit elements and network reduction techniques
CO2	Compute variables associated with magnetic circuits
CO3	Apply fundamental laws to compute electrical variables in DC&AC circuits
CO4	Analyze resonance circuits and construct locus diagrams
CO5	Apply circuit theorems to compute electrical variables in DC&AC circuits

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

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	2	2	2													
CO2	3	2										1	3	2		2
CO3	3	2	3									1	3	2		2
CO4	2	2	2										2			
CO5	3	2	3										2			
1 - Low					**2** –Medium								**3** - High			

Textbooks:

1. Engineering Circuits Analysis, Jack Kemmerly, William Hayt and Steven Durbin, Tata McGraw Hill Education, 2005, sixth edition.
2. Network Analysis, M.E.VanValkenburg, Pearson Education, 2019, Revised Third Edition

ReferenceBooks:

1. Fundamentals of Electrical Circuits, CharlesK. Alexander and Mathew N.O.Sadiku, McGraw Hill Education (India),2013, Fifth Edition
2. Electric Circuits (Schaum's outline Series),Mahmood Nahvi, Joseph Edminister, and K.Rao, McGraw Hill Education, 2017, Fifth Edition.
3. Electric Circuits, David A.Bell, Oxford University Press, 2009, Seventh Edition.
4. Introductory Circuit Analysis, RobertL Boylestad, Pearson Publications, 2023, Fourteenth Edition.
5. Circuit Theory: Analysis and Synthesis, A.Chakrabarti, Dhanpat Rai & Co., 2018, Seventh Revised Edition.

Web Resources:

1. https://onlinecourses.nptel.ac.in/noc23_ee81/preview
2. https://nptel.ac.in/courses/108104139
3. https://nptel.ac.in/courses/108106172 4. https://nptel.ac.in/courses/117106108

PART-B

COURSE DELIVERY PLAN (LESSON PLAN-B/Sec)

(Commencement of Class work w.e.f. 2-2-2026)

UNIT-I: INTRODUCTION TO ELECTRICAL 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.	**OBE & Introduction to EC-I course**	1	02-2-2026		TLM1/2	
2.	Basic Concepts of passive elements of R, L, C and their V-I relations	1	03-2-2026		TLM1/2	
3.	Sources (dependent and independent)	1	05-2-2026		TLM1/2	
4.	Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel, star-to-delta and delta-to-star transformation)	2	06-2-2026 09-2-2026		TLM1/2	
5.	**Tutorial-1**	**1**	**10-2-2026**		**TLM3**	
6.	Source transformation technique	1	12-2-2026		TLM1/2	
7.	Nodal analysis to DC networks with dependent and independent voltage and current sources	**2**	13-2-2026 16-2-2026		TLM1/2	
8.	Mesh analysis to DC networks with dependent and independent voltage and current sources	2	17-2-2026 19-2-2026		TLM1/2,	
9.	**Additional Problems**	**2**	20-2-2026 23-2-2026		**TLM1**	
11.	**Tutorial-2**	**1**	**24-2-2026**		**TLM3**	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT-II: MAGNETIC 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
12.	Basic definition of MMF, flux and reluctance, Analogy between electrical and magnetic circuits	1	26-2-2026		TLM1/2	
13.	Faraday's laws of electromagnetic induction – concept of self and mutual inductance,	2	27-2-2026 02-3-2026		TLM1/2	
14.	Dot convention – coefficient of coupling and composite magnetic circuit	2	05-3-2026 06-3-2026		TLM1/2	

15.	**Tutorial-4**	**1**	**09-3-2026**		**TLM3**	
16.	Analysis of series and parallel magnetic circuits	**2**	10-3-2026 12-3-2026		**TLM1/2**	
17.	**Tutorial-3**	**1**	**13-3-2026**		**TLM3**	
18.	**Additional Problems**	**2**	16-3-2026 17-3-2026		**TLM1**	
No. of classes required to complete UNIT-II: 11				**No. of classes taken:**		

UNIT-III: SINGLE PHASE 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**
19.	Characteristics of periodic functions, Average value, R.M.S. value, form factor	2	30-3-2026 31-3-2026		TLM1/2/3	
20.	**Tutorial-5**	**1**	**02-4-2026**		**TLM3**	
21.	Representation of a sine function, concept of phasor, phasor diagrams	1	06-4-2026		TLM1/2	
22.	Node and mesh analysis. Steady state analysis of R, L and C circuits to sinusoidal excitations	1	07-4-2026		TLM1/2	
23.	Response of pure resistance, inductance, capacitance	1	09-4-2026		TLM1/2	
24.	Series RL circuit, series RC circuit, series RLC circuit	1	10-4-2026		TLM1/2	
	Parallel RL circuit, parallel RC circuit.	2	13-4-2026 16-4-2026		TLM1/2	
25.	**Tutorial-6**	**1**	**17-4-2026**		**TLM3**	
26.	**Additional Problems**	**1**	20-4-2026		**TLM1**	
27.	**Quiz-2**	**1**	21-4-2026		**TLM1/2**	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: RESONANCE AND LOCUS DIAGRAMS

S. No.	**Topics to be covered**	**No. of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign Weekly**
29.	Series Resonance: Characteristics of a series resonant circuit	1	23-4-2026		TLM1/2	

30.	Q-factor, selectivity and bandwidth, expression for half power frequencies	1	24-4-2026		TLM1/2	
	Parallel resonance,:Q-factor, selectivity and bandwidth	1	27-4-2026		TLM1/2	
31.	**Tutorial-7**	**1**	**28-4-2026**		**TLM3**	
32.	Locus diagram: RL, RC ,RLC with R,L and C variables.	**2**	30-4-2026 01-5-2026		TLM1/2	
33.	**Tutorial-8**	**1**	**04-5-2026**		**TLM3**	
34.	**Additional Problems**	**2**	05-5-2026 **07-5-2026**		**TLM1**	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: NETWORK THEOREMS (DC & AC EXCITATIONS)

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Superposition theorem	1	08-5-2026		TLM1/2	
37.	Thevenin's theorem	1	11-5-2026		TLM1/2	
38.	Norton's theorem	**2**	12-5-2026 14-5-2026		TLM1/2	
39.	**Tutorial-9**	**1**	**15-5-2026**		**TLM3**	
40.	Maximum Power Transfer theorem	1	01-6-2026		TLM1/2	
41.	Reciprocity theorem	1	02-6-2026		TLM1/2	
42.	Millman's theorem and compensation theorem	2	04-6-2026 05-6-2026		TLM1/2	
43.	**Additional Problems**	**1**	08-6-2026		TLM1/2	
44.	**Tutorial-10**	1	**09-6-2026**		TLM3	
45.	Old Papers discussion	**2**	11-6-2026 12-6-2026		**TLM1/3**	
No. of classes required to complete UNIT-V: 13				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation)

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III (Half of the Syllabus))	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	D1=15
I-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): D+Q+A	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs)

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs)

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

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	Dr.J.Sivavara Prasad	Dr.J.Sivavara Prasad	Dr.J.S.V.Prasad	Dr.P.Sobha Rani
Signature				

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(AUTONOMOUS)

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

Phone: 08659-222933, **Fax**: 08659-222931

DIVISION OF CHEMISTRY

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Y. Subbareddy & Mr. S. Vijaya Dasaradha

Course Name & Code : Chemistry Lab & 23FE52

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

Program/Sem/Sec : I B.Tech./II Sem/EEE-A **A.Y. :** 2025-26

Pre requisites: Nil

Course Educational Objective:

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

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

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

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

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

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

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

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

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Chemistry lab, CO's, PO's	3	05-02-2026		TLM1	CO1	
2	Explanation of chemicals and glassware	3	12-02-2026		TLM4	CO1	
3.	Preparation of a Bakelite	3	19-02-2026		TLM4	CO2	
4.	Measuring of pH of water sample	3	26-02-2026		TLM4	CO4	
5.	Determination of amount of HCl using standard Na_2CO_3 solution	3	05-03-2026		TLM4	CO1	
6.	Determination of Strength of an acid in Pb-Acid battery	3	12-03-2026		TLM4	CO3	
7.	Estimation of total hardeness of given water sample	3	02-04-2026		TLM4	CO1	
8.	Alkalinity of water sample	3	09-04-2026		TLM4	CO1	
9.	Estimation of Ferrous ion by permanganometry	3	16-04-2026		TLM4	CO4	
10.	Estimation of Ferrous ion by Dichrometry	3	23-04-2026		TLM4	CO4	
11.	Conductometric titration of strong acid *versus* strong base	3	30-04-2026		TLM4	CO1	
12.	Conductometric titration of weak acid *versus* strong base	3	07-05-2026		TLM4	CO1	
13.	Additional experiment/repeat	3	14-05-2026		TLM4	CO1	
14.	Additional experiment/repeat	3	04-06-2026		TLM4	CO1	
15.	Internal Exam	3	11-06-2026		TLM4	CO1	
	Total	15					

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

PART - C

EVALUATION PROCESS:

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

(a) Continuous Internal Evaluation (CIE):

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

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**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. Y. Subbareddy**	**Dr. V.Parvathi**	**Dr. V.Parvathi**	**Dr. T.Satyanarayana**
Signature				

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Phone: 08659-222933, **Fax**: 08659-222931

DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructors: Dr. Mallikharjuna Rao D & 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/EEE-B **A.Y. :** 2025-26

Pre requisites: Nil

Course Educational Objective:

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

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

CO1: Distinguish different types of titrations in volumetric analysis after performing theexperiments 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): I EEE, 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 Chemistry lab, CO's, PO's	3	03-02-2026		TLM1		
2	Explanation of chemicals and glassware	3	10-02-2026		TLM4	CO1	
3	Preparation of a Bakelite	3	17-02-2026		TLM4	CO1	
4	Measuring of pH of water sample	3	24-02-2026		TLM4	CO1	
5	Determination of amount of HCl using standard Na_2CO_3 solution	3	10-03-2026		TLM4	CO1	
6	Determination of Strength of an acid in Pb-Acid battery	3	17-03-2026		TLM4	CO3	
7	Estimation of Ferrous Iron by permanganometry	3	31-03-2026		TLM4	CO1	
8	Estimation of Ferrous Iron by Dichrometry	3	07-04-2026		TLM4	CO1	
9	Estimation of total hardeness of given water sample	3	21-04-2026		TLM4	CO1	
10	Alkalinity of water sample	3	28-04-2026		TLM4	CO1	
11	Conductometric titration of strong acid vs. strong base	3	05-05-2026		TLM4	CO3	
12	Conductometric titration of weak acid vs. strong base	3	12-05-2026		TLM4	CO3	
13	Additional experiment/repeat	3	02-06-2026		TLM4		
14	**Internal Exam**	3	09-06-2026		TLM4		
Total							

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

Part - C

EVALUATION PROCESS:

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

(a) Continuous Internal Evaluation(CIE):

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

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

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.

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

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSEHANDOUT

PART-A

Name of Course Instructor : Dr. Pangedaiah Bezwada, R. Padma

Course Name &Code : Computer Programming Lab (23CS51)

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

Program/Sem/Sec : B.Tech.–EEE/II Sem-A A.Y. :2025-26

PRE-REQUISITE: Fundamentals of Mathematics.

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

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

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

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

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

1 –Low **2** –Medium **3**– High

PART-B

COURSE DELIVERY PLAN :

S. No.	Programs to be covered	No. of Classes		Date of Completion	Delivery Method
		Required as per the Schedule	Taken		
1.	Week1: Familiarization with programming environment	03	06-02-2026		DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03	13-02-2026		DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03	20-02-2026		DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03	27-02-2026		DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03	06-03-2026		DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03	13-03-2026		DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03	10-04-2026		DM5
8.	Week8: Exercise Programs on2 D arrays, sorting and Strings.	03	17-04-2026		DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03	24-04-2026		DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03	01-05-2026		DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03	08-05-2026		DM5
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	03	15-05-2026		DM5
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03	05-06-2026		DM5
14.	Week 14: Exercise Programs on File handling.	03	12-06-2026		DM5

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

PART-C

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to the professional engineering practice
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PO9	**Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMMESPECIFICOUTCOMES(PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. B. Pangedaiah**	**Dr. B. Srinivasarao**	**Dr. B. Srinivasarao**	**Dr. P.Sobharani**
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSEHANDOUT

PART-A

Name of Course Instructor : Dr. Pangedaiah Bezwada, R. Padma

Course Name &Code : Computer Programming Lab (23CS51)

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

Program/Sem/Sec : B.Tech.–EEE/II Sem-B A.Y. :2023-24

PRE-REQUISITE: Fundamentals of Mathematics.

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN :

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		15-02-2024	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		22-02-2024	DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03		29-02-2024	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		07-03-2024	DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03		14-03-2024	DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03		21-03-2024	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		28-03-2024	DM5
8.	Week8: Exercise Programs on2 D arrays, sorting and Strings.	03		18-04-2024	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		25-04-2024	DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03		02-05-2024	DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	03		09-05-2024	DM5
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	03		16-05-2024	DM5
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	03		23-05-2024	DM5
14.	Week 14: Exercise Programs on File handling.	03		30-05-2024	DM5

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

PART-C

PO1	**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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PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
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PO12	**Life-long learning**: Recognize the need for and have the preparation and ability to engaging independent and life-long learning in the broadest context of technological change.

PROGRAMMESPECIFICOUTCOMES(PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. B. Pangedaiah**			**Dr. J. S. V. Prasad**
Signature				

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, EEE-A/S

ACADEMIC YEAR : 2025-26

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : S. Srinivasa Reddy, Assoc. Professor,
S. Uma Maheswara Reddy, Asst Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3		2	3	3	3			3			2		3	2
CO2	3		2	3	3	3			3			2		3	2
CO3	3		2	3	3	3			3			2		3	2
CO4	3		2	3	3	3			3			2		3	2

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

REFERENCE:

R1	LabManual

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	02/02/2026		TLM8	R1	
2	Experiment-1	3	09/02/2026		TLM8	R1	
3	Experiment-2	3	16/02/2026		TLM8	R1	
4	Experiment-3	3	23/02/2026		TLM8	R1	
5	Experiment-4	3	02/03/2026		TLM8	R1	
6	Experiment-5	3	09/03/2026		TLM8	R1	
7	Experiment-6	3	16/03/2026		TLM8	R1	
I-Mid Examinations (23.03.2026 to 28.03.2026)							
8	Experiment-7	3	30/03/2026		TLM8	R1	
9	Experiment-8	3	06/04/2026		TLM8	R1	
10	Repetition lab	3	13/04/2026		TLM8	R1	
11	Repetition lab	3	20/04/2026		TLM8	R1	
12	Repetition lab	3	27/04/2026		TLM8		
13	Viva voce	3	04/05/2026		TLM6		
14	Viva voce	3	11/05/2026		TLM6		
15	Viva voce	3	01/06/2026		TLM6		
16	Lab Internal	3	08/06/2026				

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

ACADEMIC CALENDAR:

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

Part-C

EVALUATION PROCESS:

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

Details of Batches: A-SEC

Batch No.	Reg.No.of Students	Number of Students
B1	25761A0202-217	16
B2	25761A0218-233	16
B3	25761A0235-248	15
B4	25761A0249-263	15

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

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instruction

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

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

ACADEMIC YEAR : 2025-26

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr. Sankara Rao. V (T721), Sr. Asst. Professor
Mr. Seelam Srinivasa Reddy, (T113), Assoc. Professor

COURSE COORDINATOR : Mr. Seelam Srinivasa Reddy, (T113), 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 familiarize students with various trades used in Engineering Workshop such as wood working, sheet metal operations, plumbing, fitting, electrical house wiring skills, and basic repairs of two-wheeler vehicle and learn the safety precautions 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 trades of Tin smithy and plumbing such as tapered tray, conical funnel & Pipe Threading and Layout respectively.
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

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD SignWeekly
1.	Demonstration	3	05-02-2026		TLM8	-	
2.	Experiment-1	3	12-02-2026		TLM8	R1	
3.	Experiment-2	3	19-02-2026		TLM8	R1	
4.	Experiment-3	3	26-02-2026		TLM8	R1	
5.	Experiment-4	3	05-03-2026		TLM8	R1	
6.	Experiment-5	3	12-03-2026		TLM8	R1	
7.	Experiment-6	3	19-03-2026		TLM8	R1	
	I Mid Examinations (23-03-2026 – 28-03-2026)						
8.	Experiment-7	3	02.04.2026		TLM8	R1	
9.	Experiment-8	3	09.04.2026		TLM8	R1	
10.	Experiment-9	3	16.04.2026		TLM8	R1	
11.	Experiment-10	3	23.04.2026		TLM8	R1	
12.	Experiment-11	3	30.04.2026		TLM8	R1	
13.	Experiment-12	3	07.05.2026		TLM8	R1	
14.	Practice Lab	3	04.06.2026		TLM8	R1	
15.	External Lab	3	11.06.2026				
II- Mid Examinations (15-06-2026 – 20-06-2026)							

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

ACADEMIC CALENDAR:

Commencement of Class work		**02-02-2026**	
Description	**From**	**To**	**Weeks**
I Phase of Instructions	02-02-2026	21-03-2026	**7 Weeks**
I Mid Examinations	23-03-2026	28-03-2026	1 Weeks
II Phase of Instructions	30-03-2026	16-05-2026	**7 Weeks**
Summer Vacation	18-05-2026	30-05-2026	2 Weeks
II Phase of Instructions	01-06-2026	13-06-2026	2 Weeks
II Mid Examinations	15-06-2026	20-06-2026	**1 Week**
Preparation and Practicals	22-06-2026	27-06-2026	1 Week
Semester End Examinations	29-06-2026	11-07-2026	**2 Weeks**
Commencement of Next (III) Semester Class Work		**13-07-2026**	

Class Time Table - B.Tech – II Sem: EEE B- Section (R23)

↓Day / Date→	09.00 – 10.00	10.00 – 11.00	11.00 – 12.00	12.00 – 13.00	13.00 – 14.00	14.00 – 15.00	15.00 – 16.00
Monday				LUNCH BREAK			
Tuesday							
Wednesday							
Thursday					Engineering Workshop- EEE-B		
Friday							
Saturday							

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: CSE-G

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B11	24761A0233, 25761A0264-270	08	B21	25761A0295-2A2	08
B12	25761A0271-278	08	B22	25761A02A3-2B0	08
B13	25761A0279-286	08	B23	25761A02B1-2B8	08
B14	25761A0287-294	08	B24	25761A02B9-2C6	08

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	S1	S2
B12	C2	C1	F2	F1	P2	P1	E2	E1	S2	S1
B13	F1	F2	C1	C2	E1	E2	S1	S2	P1	P2
B14	F2	F1	C2	C1	E2	E1	S2	S1	P2	P1
B21	C1	C2	F1	F2	P1	P2	E1	E2	S1	S2
B22	C2	C1	F2	F1	P2	P1	E2	E1	S2	S1
B23	F1	F2	C1	C2	E1	E2	S1	S2	P1	P2
B24	F2	F1	C2	C1	E2	E1	S2	S1	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-**J**oint	CO2
4.	Fitting-2(F2)-V-**J**oint	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
9.	Sheet Metal Working(S1)-Conical Funnel	CO3
10.	Sheet Metal Working(S1)-Tapered tray	CO3

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-**J**oint	CO2
	4.	Fitting-2(F2)-V-**J**oint	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
	9.	Sheet Metal Working(S1)-Conical Funnel	CO3
	10.	Sheet Metal Working(S1)-Tapered tray	CO3
O/S	11	IDEA LAB EXPERIMENTS	03
O/S	12	WELDING AND SANDCASTING	03

*Out of the Syllabus

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.

Mr. V. Sankara Rao **S. Srinivasa Reddy**	**S. Srinivasa Reddy**	**Mr. J. Subba Reddy**	**Dr. M. B. S Sreekara Reddy**
Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**

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Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.J.Sivavara Prasad/Mr Imran Abdul/Mr P.Deepak Reddy/Mr Ratnakar Kumar

Course Name & Code : ELECTRICAL CIRCUITS LAB & 23EE52
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/EEE/II/A **A.Y.:** 2025-26

Course Educational Objective: To impart hands on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of circuit characteristics. It also gives practical exposure to the usage of different circuits with different conditions.

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

CO1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits **(Apply).**
CO2	Design resonance circuit for given specifications **(Apply).**
CO3	Analyze the RL and RC circuits with respect to parameter variation using locus diagrams **(Analyze).**
CO4	Determine self, mutual inductances and coefficient of coupling values, parameters of choke coil **(Apply).**

CO-PO Articulation matrix

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

LIST OF EXPERIMENTS

1. Verification of Kirchhoff's circuit laws.
2. Verification of node and mesh analysis.
3. Verification of network reduction techniques.
4. Determination of cold and hot resistance of an electric lamp
5. Determination of Parameters of a choke coil.
6. Determination of self, mutual inductances, and coefficient of coupling
7. Series and parallel resonance
8. Locus diagrams of R-L (L Variable) and R-C (C Variable) series circuits
9. Verification of Superposition theorem
10. Verification of Thevenin's and Norton's Theorems
11. Verification of Maximum power transfer theorem
12. Verification of Compensation theorem
13. Verification of Reciprocity and Millman's Theorems

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):
SECTION-B SCHEDULE

DAY : WEDNESDAY

Batches : **25761A0202 To 232**

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
	Tentative date	4/2	11/2	18/2	25/2	11/3	18/3	¼	8/4	15/4	22/4	29/4	6/5	13/5	3/6	10/6
	Actual date															
B-1	25761A0211 25761A0221 25761A0231	Demo	1	2	3	4	5	6	7	8	9	10				
B-2	25761A0202 25761A0212 25761A0222 25761A0232	Demo	2	3	4	5	6	7	8	9	10	1	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIMENTS
B-3	25761A0203 25761A0213 25761A0223	Demo	3	4	5	6	7	8	9	10	1	2				
B-4	25761A0204 25761A0214 25761A0224	Demo	4	5	6	7	8	9	10	1	2	3				
B-5	25761A0205 25761A0215 25761A0225	Demo	5	6	7	8	9	10	1	2	3	4				
B-6	25761A0206 25761A0216 25761A0226	Demo	6	7	8	9	10	1	2	3	4	5				
B-7	25761A0207 25761A0217 25761A0227	Demo	7	8	9	10	1	2	3	4	5	6				
B-8	25761A0208 25761A0218 25761A0228	Demo	8	9	10	1	2	3	4	5	6	7				
B-9	25761A0209 25761A0219 25761A0229	Demo	9	10	1	2	3	4	5	6	7	8				
B-10	25761A0210 25761A0220 25761A0230	Demo	10	1	2	3	4	5	6	7	8	9				

DAY : WEDNESDAY

Batches : **25761A0233 To 263**

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
	Tentative date	4/2	11/2	18/2	25/2	11/3	18/3	¼	8/4	15/4	22/4	29/4	6/5	13/5	3/6	10/6
	Actual date															
B-1	25761A0241 25761A0251 25761A0261	Demo											REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIMENTS
B-2	25761A0242 25761A0252 25761A0262	Demo														
B-3	25761A0233 25761A0243 25761A0253 25761A0263	Demo														
B-4	25761A0234 25761A0244 25761A0254	Demo														
B-5	25761A0235 25761A0245 25761A0255	Demo														
B-6	25761A0236 25761A0246 25761A0256	Demo														
B-7	25761A0237 25761A0247 25761A0257	Demo														
B-8	25761A0238 25761A0248 25761A0258	Demo														
B-9	25761A0239 25761A0249 25761A0259	Demo														
B-10	25761A0240 25761A0250 25761A0260	Demo														

PART-C

EVALUATION PROCESS (R23 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.J.Sivavara Prasad, Mr Imran Abdul/ Mr P.Deepak Reddy/ Mr Ratnakar Kumar	Dr.J.Sivavara Prasad	**Dr. P. Sobharani**	**Dr. P. Sobharani**
Signature				

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Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. JVPC / Dr AVGMl / Dr.YRV / Dr JSVP
Course Name & Code : ELECTRICAL CIRCUITS LAB & 23EE52
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/EEE/II/B **A.Y.:** 2025-26

Course Educational Objective: To impart hands on experience in verification of circuit laws and theorems, measurement of circuit parameters, study of circuit characteristics. It also gives practical exposure to the usage of different circuits with different conditions.

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

CO1	Demonstrate fundamental circuit laws, network theorems, node and mesh analysis of electrical circuits **(Apply).**
CO2	Design resonance circuit for given specifications **(Apply).**
CO3	Analyze the RL and RC circuits with respect to parameter variation using locus diagrams **(Analyze).**
CO4	Determine self, mutual inductances and coefficient of coupling values, parameters of choke coil **(Apply).**

CO-PO Articulation matrix

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

LIST OF EXPERIMENTS

1. Verification of Kirchhoff's circuit laws.
2. Verification of node and mesh analysis.
3. Verification of network reduction techniques.
4. Determination of cold and hot resistance of an electric lamp
5. Determination of Parameters of a choke coil.
6. Determination of self, mutual inductances, and coefficient of coupling
7. Series and parallel resonance
8. Locus diagrams of R-L (L Variable) and R-C (C Variable) series circuits
9. Verification of Superposition theorem
10. Verification of Thevenin's and Norton's Theorems
11. Verification of Maximum power transfer theorem
12. Verification of Compensation theorem
13. Verification of Reciprocity and Millman's Theorems

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):
SECTION-B SCHEDULE

DAY : SATURDAY

Batches : **24761A0233,25761A0264-25761A0294**

B.NO	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
	Tentative date	07/02	14/02	21/02	28/02	07/03	14/03	04/04	11/04	18/04/	25/04	02/05	09/05	16/05	06/06	13/06
	Actual date															
B-1	25761A0271 25761A0281 25761A0291	Demo	1	2	3	4	5	6	7	8	9	10	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIMENTS
B-2	25761A0272 25761A0282 25761A0292	Demo	2	3	4	5	6	7	8	9	10	1				
B-3	24761A0233 25761A0273 25761A0283 25761A0293	Demo	3	4	5	6	7	8	9	10	1	2				
B-4	25761A0264 25761A0274 25761A0284 25761A0294	Demo	4	5	6	7	8	9	10	1	2	3				
B-5	25761A0265 25761A0275 25761A0285	Demo	5	6	7	8	9	10	1	2	3	4				
B-6	25761A0266 25761A0276 25761A0286	Demo	6	7	8	9	10	1	2	3	4	5				
B-7	25761A0267 25761A0277 25761A0287	Demo	7	8	9	10	1	2	3	4	5	6				
B-8	25761A0268 25761A0278 25761A0288	Demo	8	9	10	1	2	3	4	5	6	7				
B-9	25761A0269 25761A0279 25761A0289	Demo	9	10	1	2	3	4	5	6	7	8				
B-1	25761A0270 25761A0280 25761A0290	Demo	10	1	2	3	4	5	6	7	8	9				

DAY : SATURDAY

Batches : **24761A0295 To 2C6**

B.No	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
	Tentative date	07/02	14/02	21/02	28/02	07/03	14/03	04/04	11/04	18/04/	25/04	02/05	09/05	16/05	06/06	13/06
	Actual date															
B-1	25761A02A1 25761A02B1 25761A02C1	Demo											REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM	REVISION OF EXPERIMENTS
B-2	25761A02A2 25761A02B2 25761A02C2	Demo														
B-3	25761A02A3 25761A02B3 25761A02C3	Demo														
B-4	25761A02A4 25761A02B4 25761A02C4	Demo														
B-5	25761A0295 25761A02A5 25761A02B5 25761A02C5	Demo														
B-6	25761A0296 25761A02A6 25761A02B6 25761A02C6	Demo														
B-7	25761A0297 25761A02A7 25761A02B7	Demo														
B-8	25761A0298 25761A02A8 25761A02B8	Demo														
B-9	25761A0299 25761A02A9 25761A02B9	Demo														
B-1	25761A02A0 25761A02B0 25761A02C0	Demo														

PART-C

EVALUATION PROCESS (R23 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr J V PAVAN CHAND Dr.A.V.G.M.Mathanda Dr.Y.Raghu VAmsi Dr.J.S.V.Prasad**	**Dr.J.S.V.PRASAD**	**Dr.J.S.V.PRASAD**	**Dr. P. Sobharani**
Signature				