LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Lakshmi V R BabuSyamala
Course Name & Code **:**Chemistry & 23FE02
L-T-P Structure **:3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech./Sem-II/EEE-A **A.Y. :**2023-24

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

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

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

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

Textbooks:

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

Reference: Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): 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.	Fundamentals Of Quantum Mechanics	1	14-02-2024		TLM1	
2.	Schrodinger Wave Equation, Significance of Ψ and Ψ^2	1	16-02-2024		TLM1	
3.	Particle In one dimensional box	1	17-02-2024		TLM1	
4.	Molecular Orbital Theory – Bonding in Homonuclear Diatomic Molecules-Energy level diagrams (H_2 to Ne_2)	2	19-02-2024 & 21-02-2024		TLM1	
5.	Molecular Orbital Theory – Bonding in Homo- and Heteronuclear Diatomic Molecules-Energy level diagrams(CO, NO)	2	23-02-2024 & 24-02-2024		TLM1	
6.	Energy level diagrams-Summary	1	26-02-2024		TLM1	
7.	π-molecular orbitals of butadiene	1	28-02-2024		TLM1	
8.	π-molecular orbitals of benzene	1	01-03-2024		TLM1	
9.	Calculation of Bond order	1	02-03-2024		TLM1	
10.	Revision and assignment	1	04-03-2024		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: MODERN ENGINEERING MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Semiconductors - Introduction	1	06-03-2024		TLM1	
2.	Semiconductors - Basic concept&applications	1	09-03-2024		TLM1	
3.	Super conductors - Introduction	1	11-03-2024		TLM1	
4.	Super conductors - Basic concept & applications	1	13-03-2024		TLM1	
5.	Supercapacitors - Introduction	1	15-03-2024		TLM1	
6.	Supercapacitors - Basic concept-classification&applications	1	16-03-2024		TLM1	
7.	Nano materials - Introduction	1	18-03-2024		TLM2	
8.	Nano materials - classification	1	20-03-2024		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	22-03-2024		TLM2	
10.	Nano materials - carbon nano tubes and graphine nanoparticles	2	23-03-2024 & 27-03-2024		TLM2	
11.	Revision and assignment	1	30-03-2024		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	08-04-2024		TLM1	
2.	Cell potential calculations and numerical problems	2	10-04-2024 & 12-04-2024		TLM1	
3.	Potentiometry-potentiometric titrations (redox titrations)	1	13-04-2024		TLM1	
4.	Concept of conductivity, conductivitycell, conductometric titrations (acid-base titrations)	1	15-04-2024		TLM1	
5.	Electrochemical sensors – potentiometric sensors with examples,	1	19-04-2024		TLM1	

	amperometric sensors with examples					
6.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries-working of the batteries including cell reactions	2	20-04-2024 & 22-04-2024		TLM1	
7.	Fuel cells, hydrogen-oxygen fuel cell– working of the cells, Polymer Electrolyte Membrane Fuel cells (PEMFC)	1	24-04-2024		TLM1	
8.	Revision and assignment	1	26-04-2024		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to polymers, functionality of monomers	1	27-04-2024		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	29-04-2024		TLM1	
3.	Mechanisms of polymer formation	1	01-05-2024		TLM1	
4.	Plastics –Thermo and Thermosetting plastics	1	03-05-2024		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	2	04-05-2024 & 06-05-2024		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	08-05-2024		TLM1	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	10-05-2024		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	11-05-2024		TLM1	
9.	Revision and assignment	1	13-05-2024		TLM1	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: INSTRUMENTAL METHODS AND APPLICATIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Electromagnetic spectrum	1	15-05-2024		TLM1	
2.	Absorption of radiation: Beer-Lambert's law	1	17-05-2024		TLM1	
3.	UV-Visible Spectroscopy	1	18-05-2024		TLM1	
4.	electronic transition, Instrumentation	1	20-05-2024		TLM1	
5.	IR spectroscopies, fundamental modes	1	22-05-2024		TLM1	
6.	selection rules, Instrumentation	1	24-05-2024		TLM1	
7.	Chromatography-Basic Principle	1	25-05-2024		TLM1	
8.	Classification-HPLC: Principle, Instrumentation and Applications	2	27-05-2024 & 29-05-2024		TLM1	
9.	Revision and assignment	1	31-05-2024		TLM1	
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	2	01-05-2024		TLM1	

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

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5
I-Descriptive Examination (Units-I, II)	M1=15
I-Quiz Examination (Units-I, II)	Q1=10

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Lakshmi V R BabuSyamala	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.VijayaDasaradha
Course Name & Code **:** Chemistry&23FE02
L-T-P Structure **:3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech/I-Sem/EEE-B **A.Y. :**2023-24

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

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

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

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

Textbooks:

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

Reference: Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: STRUCTURE AND BONDING

MODELS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Fundamentals Of Quantum Mechanics	1	12-02-2024		TLM1	
2.	Fundamentals Of Quantum Mechanics	1	14-02-2024		TLM1	
3.	Schrodinger Wave Equation	1	15-02-2024		TLM1	
4.	Significance of Ψ and Ψ^2	1	17-02-2024		TLM2	
5.	Particle In one dimensional box	1	19-02-2024		TLM1	
6.	Molecular Orbital Theory – Bonding in Homo and Hetero nuclear Diatomic Molecules	1	21-02-2024		TLM1	
7.	Energy level diagrams of O_2 and N_2	1	22-02-2024		TLM2	
8.	Energy level diagrams of CO and NO	1	24-02-2024		TLM1	
9.	π-molecular orbitals of butadiene	1	26-02-2024		TLM1	
10.	π-molecular orbitals of benzene	1	28-02-2024		TLM1	
11.	Calculation of Bond order	1	29-02-2024		TLM2	
12.	Practice of Molecular orbital diagrams	1	02-03-2024		TLM1	
13.	Revision	1	04-03-2024		TLM1	
14.	Revision	1	06-03-2024		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	07-03-2024		TLM1	
2.	Semiconductors - Basic concept&applications	1	09-03-2024		TLM1	
3.	Super conductors - Introduction	1	11-03-2024		TLM2	
4.	Super conductors - Basic concept&applications	1	13-03-2024		TLM1	
5.	Supercapacitors - Introduction	1	14-03-2024		TLM1	
6.	Supercapacitors - Basic concept-classification&applications	1	16-03-2024		TLM1	
7.	Nano materials - Introduction	1	18-03-2024		TLM2	
8.	Nano materials - classification	1	20-03-2024		TLM2	
9.	Nano materials - properties and applications of fullerenes	1	21-03-2024&23-03-24		TLM2	
10.	Nano materials - carbon nano tubes and graphine nanoparticles	1	27-03-2024&28,30-03-24		TLM2	
No. of classes required to complete UNIT-II: 13				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction Electrochemical cell	1	08-04-2024		TLM1	
2.	Nernst equation derivation	1	10-04-2024		TLM1	
3.	Applications of Nernst equation.	1	13-04-2024		TLM1	
4.	Cell potential calculations and numerical problems	1	15-04-2024		TLM1	
5.	Potentiometry-potentiometric titrations (redox titrations)	1	18-04-2024		TLM1	
6.	Concept of conductivity, conductivitycell, conductometric titrations (acid-base titrations)	1	20-04-2024		TLM2	
7.	Electrochemical sensors – potentiometric sensors with examples,	1	22-04-2024		TLM1	

	amperometric sensors with examples					
8.	Primary cells – Zinc-air battery, Secondary cells – lithium-ion batteries-working of the batteries including cell reactions	1	24-04-2024		TLM1	
9.	Fuel cells, hydrogen-oxygenfuel cell– working of the cells	1	25-04-2024		TLM2	
10.	PolymerElectrolyte Membrane Fuel cells (PEMFC)	1	27-04-2024		TLM1	
No. of classes required to complete UNIT-III: 10				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to polymers, functionality of monomers	1	29-04-2024		TLM1	
2.	Chain growth and step growth polymerization, coordination polymerization, with specific examples	1	01-05-2024		TLM1	
3.	Mechanisms of polymer formation	1	02-05-2024		TLM2	
4.	Plastics –Thermo and Thermosetting plastics	1	04-05-2024		TLM1	
5.	Preparation, properties and applications of – PVC, Teflon, Bakelite, Nylon-6,6, carbon fibres	1	06-05-2024& 08-05-2024		TLM1	
6.	Elastomers–Buna-S, Buna-N–preparation, properties and applications	1	09-05-2024& 11-05-2024		TLM2	
7.	Conducting polymers – polyacetylene, polyaniline, – mechanism of conduction and applications	1	13-05-2024		TLM1	
8.	Bio-Degradable polymers - Poly Glycolic Acid (PGA), Polyl Lactic Acid (PLA)	1	15-05-2024& 16-05-24		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	18-05-2024		TLM1	

2.	Absorption of radiation: Beer-Lambert's law	1	20-05-2024		TLM1	
3.	UV-Visible Spectroscopy	1	22-05-2024		TLM1	
4.	electronic transition, Instrumentation	1	23-05-2024		TLM1	
5.	IR spectroscopies, fundamental modes	1	25-05-2024		TLM2	
6.	selection rules, Instrumentation	1	27-05-2024		TLM1	
7.	Chromatography-Basic Principle	1	29-05-2024		TLM2	
8.	Classification-HPLC: Principle, Instrumentation and Applications	1	30-05-2024		TLM1	
No. of classes required to complete UNIT-V: 08				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Applications of semiconductors, superconductors and nanomaterials in advanced technologies.	1	01-06-2024		TLM1	

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.S.VijayaDasaradha**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., EEE - A
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K.R. Kavitha
COURSE COORDINATOR	**:** Dr. K.R. Kavitha
PRE-REQUISITES	**:** Basics of Vectors**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**

1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	14-02-2024		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	14-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	15-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	17-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	21-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	21-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	22-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	24-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	26-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	28-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	28-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	29-02-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	02-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	04-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	06-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		15			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	06-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	07-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	13-03-2024		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	13-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	14-03-2024		TLM1	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	16-03-2024		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	18-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	20-03-2024		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	20-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	21-03-2024		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	23-03-2024		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	27-03-2024		TLM1	CO1	T1,T2	
31.	TUTORIAL - II	1	27-03-2024		TLM3	CO1	T1,T2	
32.	Simple Harmonic motion	1	28-03-2024		TLM1	CO1	T1,T2	
33.	Revision	1	30-03-2024		TLM1	CO1		
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	10-04-2024		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	15-04-2024		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	18-04-2024		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	20-04-2024		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	22-04-2024		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	24-04-2024		TLM1	CO2	T1,T2	
42.	TUTORIAL - III	1	24-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	Introduction to UNIT IV	1	25-04-2024		TLM1	CO3	T1,T2	
44.	Vector Differentiation	1	27-04-2024		TLM1	CO3	T1,T2	
45.	Gradient	1	29-04-2024		TLM1	CO3	T1,T2	

46.	Directional Derivative	1	01-05-2024		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	01-05-2024		TLM1	CO3	T1,T2	
48.	Divergence	1	02-05-2024		TLM1	CO3	T1,T2	
49.	Curl	1	04-05-2024		TLM1	CO3	T1,T2	
50.	Problems	1	06-05-2024		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	08-05-2024		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	08-05-2024		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	09-05-2024		TLM1	CO3	T1,T2	
54.	Vector Identities	1	11-05-2024		TLM1	CO3	T1,T2	
55.	TUTORIAL IV	1	15-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	13-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	15-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	16-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
62.	Flux	1	22-05-2024		TLM1	CO4	T1,T2	
63.	Volume Integral	1	22-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	23-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	29-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	29-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	2	30-05-2024 01-06-2024		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)

TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., I-Sem., EEE - B
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. D. VIJAY KUMAR
COURSE COORDINATOR : Dr. D. K. R. Kavitha
PRE-REQUISITES : Basics of Vectors**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

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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	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	13-02-2024		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	15-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	16-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	17-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	20-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	22-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	23-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	24-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	26-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	27-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	29-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	01-03-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	02-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	04-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	05-03-2024		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
18.	Introduction to UNIT II	1	07-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	12-03-2024		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	14-03-2024		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	15-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	16-03-2024		TLM1	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	18-03-2024		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	19-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	21-03-2024		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	22-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	23-03-2024		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	26-03-2024		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	28-03-2024		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	30-03-2024		TLM1	CO1	T1,T2	
32.	TUTORIAL - II	1	30-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	12-04-2024		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	13-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	15-04-2024		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	16-04-2024		TLM1	CO2	T1,T2	
38.	Lagrange's Method	1	18-04-2024		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	19-04-2024		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	20-04-2024		TLM1	CO2	T1,T2	
41.	TUTORIAL - III	1	22-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentia

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Introduction to UNIT IV	1	23-04-2024		TLM1	CO3	T1,T2	
43.	Vector Differentiation	1	25-04-2024		TLM1	CO3	T1,T2	
44.	Gradient	1	26-04-2024		TLM1	CO3	T1,T2	
45.	Directional Derivative	1	27-04-2024		TLM1	CO3	T1,T2	

46.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
47.	Divergence	1	30-04-2024		TLM1	CO3	T1,T2	
48.	Curl	1	02-05-2024		TLM1	CO3	T1,T2	
49.	Problems	1	03-05-2024		TLM1	CO3	T1,T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	04-05-2024		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
52.	Laplacian, second order operators	1	07-05-2024		TLM1	CO3	T1,T2	
53.	Vector Identities	1	09-05-2024		TLM1	CO3	T1,T2	
54.	Vector Identities	1	10-05-2024		TLM1	CO3	T1,T2	
55.	TUTORIAL IV	1	13-05-2024		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
57.	Introduction to Unit-V	1	14-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	16-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	17-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	21-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	23-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	24-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	28-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	30-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	1	31-05-2024		TLM2	CO2	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)

TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

Dr. D. VIJAY KUMAR	Dr. K.R. KAVITHA	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF 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/**B-Sec** **A.Y.: 2023-24**
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	12-02-24		TLM1	
2.	Role of Mechanical Engineering in Industries and Society	1	13-02-24		TLM1	
3.	Technologies in different sectors such as Energy	1	15-02-24		TLM1	
4.	Technologies in different sectors such as Manufacturing	1	16-02-24		TLM1	
5.	Technologies in different sectors such as Automotive	1	17-02-24		TLM1	
6.	Technologies in different sectors such as Aerospace, and Marine sectors	1	19-02-24		TLM1	
7.	Engineering Materials - Metals	1	20-02-24		TLM1	
8.	Ferrous Metals	1	22-02-24		TLM1	
9.	Non-ferrous Metals	1	23-02-24		TLM1	
10.	Ceramic	1	24-02-24		TLM1	
11.	Composites	1	26-02-24		TLM1	
12.	Smart materials	1	27-02-24		TLM1	
No. of classes required to complete UNIT-I: 12				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
13.	Manufacturing Processes, Principles of Casting	1	29-02-24		TLM1	
14.	Forming, joining processes	1	01-03-24		TLM1	
15.	Introduction to CNC machines	1	02-03-24		TLM1	
16.	3D printing, and Smart manufacturing	1	04-03-24		TLM2	
17.	Thermal Engineering- Working principle of Boilers	1	05-03-24		TLM1	
18.	Otto cycle	1	07-03-24		TLM2	
19.	Diesel cycle	1	11-03-24		TLM2	
20.	Refrigeration and air-conditioning cycles	1	12-03-24		TLM1	
21.	IC engines	1	14-03-24		TLM2	
22.	2-Stroke and 4-Stroke engines	1	15-03-24		TLM1	

23.	SI/CI Engines	1	16-03-24		TLM1	
24.	Components of Electric and Hybrid Vehicles	1	18-03-24		TLM2	
No. of classes required to complete UNIT-II: 12				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
25.	Power plants – Working principle of Steam power plants	1	19-03-24		TLM1	
26.	Power plants – Working principle of Diesel power plants	1	21-03-24		TLM1	
27.	Power plants – Working principle of Hydro power plants	1	22-03-24		TLM1	
28.	Power plants – Working principle of nuclear power plants	1	23-03-24		TLM1	
29.	Mechanical Power Transmission - Belt Drives	1	26-03-24		TLM1	
30.	Chain, Rope drives, Gear Drives and their applications	1	28-03-24		TLM1	
31.	Introduction to Robotics- Joints & links, Application of robotics	1	30-03-24		TLM2	
I-Mid Exams			01-04-2024 To 06-04-2024			
No. of classes required to complete UNIT-III: 07				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

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DEPARTMENT OF ELECTRICAL AND ELECTRONICS ENGINEERING (EEE)

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. K.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.: 2023-24**
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.

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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	12-02-24		TLM1	
2.	Role of Mechanical Engineering in Industries and Society	1	13-02-24		TLM1	
3.	Technologies in different sectors such as Energy	1	14-02-24		TLM1	
4.	Technologies in different sectors such as Manufacturing	1	15-02-24		TLM1	
5.	Technologies in different sectors such as Automotive	1	16-02-24		TLM1	
6.	Technologies in different sectors such as Aerospace, and Marine sectors	1	19-02-24		TLM1	
7.	Engineering Materials - Metals	1	20-02-24		TLM1	
8.	Ferrous Metals	1	21-02-24		TLM1	
9.	Non-ferrous Metals	1	22-02-24		TLM1	
10.	Ceramic	1	23-02-24		TLM1	
11.	Composites	1	26-02-24		TLM1	
12.	Smart materials	1	27-02-24		TLM1	
No. of classes required to complete UNIT-I: 12				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
13.	Manufacturing Processes, Principles of Casting	1	28-02-24		TLM1	
14.	Forming, joining processes	1	29-02-24		TLM1	
15.	Introduction to CNC machines	1	01-03-24		TLM1	
16.	3D printing, and Smart manufacturing	1	04-03-24		TLM2	
17.	Thermal Engineering- Working principle of Boilers	1	05-03-24		TLM1	
18.	Otto cycle	1	06-03-24		TLM2	
19.	Diesel cycle	1	07-03-24		TLM2	
20.	Refrigeration and air-conditioning cycles	1	11-03-24		TLM1	
21.	IC engines	1	12-03-24		TLM2	
22.	2-Stroke and 4-Stroke engines	1	13-03-24		TLM1	

23.	SI/CI Engines	1	14-03-24		TLM1	
24.	Components of Electric and Hybrid Vehicles	1	15-03-24		TLM2	
No. of classes required to complete UNIT-II: 12				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
25.	Power plants – Working principle of Steam power plants	1	18-03-24		TLM1	
26.	Power plants – Working principle of Diesel power plants	1	19-03-24		TLM1	
27.	Power plants – Working principle of Hydro power plants	1	20-03-24		TLM1	
28.	Power plants – Working principle of nuclear power plants	1	21-03-24		TLM1	
29.	Mechanical Power Transmission - Belt Drives	1	22-03-24		TLM1	
30.	Chain, Rope drives	1	26-03-24		TLM1	
31.	Gear Drives and their applications	1	27-03-24		TLM2	
32.	Introduction to Robotics- Joints & links	1	28-03-24		TLM2	
33.	Configurations and applications of robotics	1	30-03-24		TLM2	
I-Mid Exams			01-04-2024 To 06-04-2024			
No. of classes required to complete UNIT-III: 09				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (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

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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.: 2023-24

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	13-02-2024		TLM2	
2.	History of Computers	1	14-02-2024		TLM2	
3.	Basic organization of a computer: ALU, input-output units.	2	15-02-2024 17-02-2024		TLM2	
4.	Memory, program counter	1	19-02-2024		TLM2	
5.	Introduction to Programming Languages,	1	20-02-2024		TLM2	
6.	Basics of a Computer Program-Algorithms	1	21-02-2024		TLM2	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	22-02-2024		TLM2	
8.	Introduction to Compilation and Execution	1	24-02-2024		TLM2	
9.	Primitive Data Types	2	26-02-2024 27-02-2024		TLM2	
10.	Variables, and Constants, Basic Input and Output operations	1	28-02-2024		TLM2	
11.	Type Conversion, and Casting	1	29-02-2024		TLM2	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	02-03-2024		TLM2	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	04-03-2024		TLM2	
14	Time and space complexities of algorithms.	1	05-03-2024		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	06-03-2024		TLM2	
16.	if, if-else	1	07-03-2024		TLM2	
17.	switch	1	11-03-2024		TLM2	
18.	Example programs on Decision Making and Branching	1	12-03-2024 13-03-2024		TLM2	
19.	Loops: while , Example programs	2	14-03-2024 16-03-2024		TLM2	
20.	do-while, for, Example programs	2	18-03-2024 19-03-2024		TLM2	
21.	on Loops	1	20-03-2024		TLM2	
22.	Break and Continue	1	21-03-2024		TLM2	
23.	Example programs on Loops	1	23-03-2024		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	08-04-2024		TLM2	
25.	Array indexing, Accessing elements	1	10-04-2024		TLM2	
26.	memory model	1	15-04-2024		TLM2	
27.	programs with array of integers	1	16-04-2024		TLM2	
28.	Introduction to two dimensional arrays	1	18-04-2024		TLM2	
29.	2D Array indexing, Accessing elements	1	20-04-2024		TLM2	
30.	programs with 2D arrays	1	22-04-2024		TLM2	
31.	Introduction to Strings	1	23-04-2024		TLM2	
32.	Reading and Writing Operations on Strings	1	24-04-2024		TLM2	
33.	String Handling Functions	1	25-04-2024		TLM2	
34.	Example Programs using Strings	1	27-04-2024		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	29-04-2024		TLM2	
36.	dereferencing and address operators	1	30-04-2024		TLM2	
37.	pointer and address arithmetic	1	01-05-2024		TLM2	
38.	array manipulation using pointers	2	02-05-2024 04-05-2024		TLM2	
39.	User-defined data types	1	06-05-2024		TLM2	
40.	Structures , Definition and Initialization	2	07-05-2024 08-05-2024		TLM2	
41.	Example programs	1	09-05-2024		TLM2	
42.	Unions	2	13-05-2024 14-05-2024		TLM2	
43.	Example programs	1	15-05-2024		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	16-05-2024		TLM2	
45.	Function Declaration and Definition	1	18-05-2024		TLM2	
46.	Function call Return Types	1	20-05-2024		TLM2	
47.	Arguments	1	21-05-2024		TLM2	
48.	modifying parameters inside functions using pointers	2	22-05-2024 23-05-2024		TLM2	
49.	arrays as parameters	1	25-05-2024		TLM2	
50.	Scope and Lifetime of Variables	1	27-05-2024		TLM2	

51.	Introduction to Files	1	28-05-2024		TLM2	
52.	Basics of File Handling	1	29-05-2024		TLM2	
53.	Operations on Files	1	30-05-2024		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	01-06-2024		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. J. S. V. Prasad**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

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

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

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF 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/B A.Y.: 2023-24

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	13-02-2024		TLM2	
2.	History of Computers	1	14-02-2024		TLM2	
3.	Basic organization of a computer: ALU, input-output units.	2	16-02-2024 17-02-2024		TLM2	
4.	Memory, program counter	1	19-02-2024		TLM2	
5.	Introduction to Programming Languages,	1	20-02-2024		TLM2	
6.	Basics of a Computer Program-Algorithms	1	21-02-2024		TLM2	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	23-02-2024		TLM2	
8.	Introduction to Compilation and Execution	1	24-02-2024		TLM2	
9.	Primitive Data Types	2	26-02-2024 27-02-2024		TLM2	
10.	Variables, and Constants, Basic Input and Output operations	1	28-02-2024		TLM2	
11.	Type Conversion, and Casting	1	01-03-2024		TLM2	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	02-03-2024		TLM2	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	04-03-2024		TLM2	
14	Time and space complexities of algorithms.	1	05-03-2024		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	06-03-2024		TLM2	
16.	if, if-else	1	11-03-2024		TLM2	
17.	switch	1	12-03-2024		TLM2	
18.	Example programs on Decision Making and Branching	1	13-03-2024 15-03-2024		TLM2	
19.	Loops: while , Example programs	2	16-03-2024 18-03-2024		TLM2	
20.	do-while, for, Example programs	2	19-03-2024 20-03-2024		TLM2	
21.	on Loops	1	22-03-2024		TLM2	
22.	Break and Continue	1	23-03-2024		TLM2	
23.	Example programs on Loops	1	26-03-2024		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	08-04-2024		TLM2	
25.	Array indexing, Accessing elements	1	10-04-2024		TLM2	
26.	memory model	1	12-04-2024		TLM2	
27.	programs with array of integers	1	15-04-2024		TLM2	
28.	Introduction to two dimensional arrays	1	16-04-2024		TLM2	
29.	2D Array indexing, Accessing elements	1	19-04-2024		TLM2	
30.	programs with 2D arrays	1	20-04-2024		TLM2	
31.	Introduction to Strings	1	22-04-2024		TLM2	
32.	Reading and Writing Operations on Strings	1	23-04-2024		TLM2	
33.	String Handling Functions	1	24-04-2024		TLM2	
34.	Example Programs using Strings	1	26-04-2024		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	27-04-2024		TLM2	
36.	dereferencing and address operators	1	29-04-2024		TLM2	
37.	pointer and address arithmetic	1	30-04-2024		TLM2	
38.	array manipulation using pointers	2	01-05-2024 03-05-2024		TLM2	
39.	User-defined data types	1	04-05-2024		TLM2	
40.	Structures , Definition and Initialization	2	06-05-2024 07-05-2024		TLM2	
41.	Example programs	1	08-05-2024		TLM2	
42.	Unions	2	10-05-2024 13-05-2024		TLM2	
43.	Example programs	1	14-05-2024		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	15-05-2024		TLM2	
45.	Function Declaration and Definition	1	17-05-2024		TLM2	
46.	Function call Return Types	1	18-05-2024		TLM2	
47.	Arguments	1	20-05-2024		TLM2	
48.	modifying parameters inside functions using pointers	2	21-05-2024 22-05-2024		TLM2	
49.	arrays as parameters	1	24-05-2024		TLM2	
50.	Scope and Lifetime of Variables	1	25-05-2024		TLM2	

51.	Introduction to Files	1	27-05-2024		TLM2	
52.	Basics of File Handling	1	28-05-2024		TLM2	
53.	Operations on Files	1	29-05-2024		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	01-06-2024		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. J. S. V. Prasad**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF EEE

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. M. Uma Vani
Course Name & Code: **ELECTRICALCIRCUITANALYSIS-I (23EE02)**
L-T-P Structure **:** 3-0-0 **Credits:** 3
Program/Sem/Sec : B.Tech/II/A & B **A.Y.: 2023-24**
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.

WebResources:

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. 13-2-2024)

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	13-2-2024		TLM1/2	
2.	Basic Concepts of passive elements of R, L, C and their V-I relations	1	14-2-2024		TLM1/2	
3.	Sources (dependent and independent)	1	15-2-2024		TLM1/2	
4.	Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel, star-to-delta and delta-to-star transformation)	2	16-2-2024 17-2-2024		TLM1/2	
5.	**Tutorial-1**	**1**	**20-2-2024**		**TLM3**	
6.	Source transformation technique	1	21-2-2024		TLM1/2	
7.	Nodal analysis to DC networks with dependent and independent voltage and current sources	**2**	22-2-2024 23-2-2024		TLM1/2	
8.	Mesh analysis to DC networks with dependent and independent voltage and current sources	2	24-2-2024 27-2-2024		TLM1/2,	
9.	**Additional Problems**	**2**	28-2-2024 29-2-2024		**TLM1**	
10.	**Tutorial-2/ GATE questions**	**1**	**1-3-2024**		**TLM3**	
11.	**Quiz-1**	**1**	**2-3-2024**		**TLM3**	
No. of classes required to complete UNIT-I: 15				**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	5-3-2024		TLM1/2	
13.	Faraday's laws of electromagnetic induction – concept of self and mutual inductance,	1	6-3-2024		TLM1/2	
14.	Dot convention – coefficient of coupling and composite magnetic circuit	1	7-3-2024		TLM1/2	

15.	Analysis of series and parallel magnetic circuits	**2**	**12-3-2024** 14-3-2024		**TLM1/2**	
16.	**Tutorial-3**	**1**	**13-3-2024**		**TLM3**	
17.	**Additional Problems**	**2**	15-3-2024 16-3-2024		**TLM1**	
18.	**Tutorial-4**	**1**	**20-3-2024**		**TLM3**	
No. of classes required to complete UNIT-II: 9				**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	19-3-2024 21-3-2024		TLM1/2/3	
20.	Representation of a sine function, concept of phasor, phasor diagrams	1	22-3-2024		TLM1/2	
21.	Node and mesh analysis. Steady state analysis of R, L and C circuits to sinusoidal excitations	2	23-3-2024 26-3-2024		TLM1/2	
22.	**Tutorial-5**	**1**	**27-3-2024**		**TLM3**	
	Mid-I from 1-4-2024 to 6-4-2024					
23.	Response of pure resistance, inductance, capacitance	1	28-3-2024		TLM1/2	
24.	Series RL circuit, series RC circuit, series RLC circuit	2	30-3-2024		TLM1/2	
25.	**Tutorial-6/ GATE questions**	**1**	**10-4-2024**		**TLM3**	
26.	Parallel RL circuit, parallel RC circuit.	2	12-4-2024 16-4-2024		TLM1/2	
27.	**Additional Problems**	**1**	18-4-2024		**TLM1**	
28.	**Quiz-2**	**1**	19-4-2024		**TLM1/2**	
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: RESONANCEAND 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	20-4-2024		TLM1/2	
30.	Q-factor ,selectivity and bandwidth, expression for half power frequencies	1	23-4-2024		TLM1/2	
31.	**Tutorial-7**	**1**	**24-4-2024**		**TLM3**	
32.	Parallel resonance,:Q-factor, selectivity and bandwidth	1	25-4-2024		TLM1/2	
33.	Locus	**2**	26-4-2024		TLM1/2	

	diagram: RL, RC ,RLC with R,L and C variables.		27-4-2024			
34.	**Additional Problems**	**2**	30-4-2024 **2-5-2024**		**TLM1**	
35.	**Tutorial-8/ GATE questions**	**1**	**1-5-2024**		**TLM3**	
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	3-5-2024		TLM1/2	
37.	Thevenin's theorem	1	4-5-2024		TLM1/2	
38.	Norton's theorem	**1**	7-5-2024		TLM1/2	
39.	**Tutorial-9**	**1**	**8-5-2024**		**TLM3**	
40.	Maximum Power Transfer theorem	1	9-5-2024		TLM1/2	
41.	Reciprocity theorem	1	10-5-2024		TLM1/2	
42.	Millman's theorem and compensation theorem	2	14-5-2024 16-5-2024		TLM1/2	
43.	**Tutorial-10**	1	**15-5-2024**		TLM3	
44.	**Additional Problems**	**2**	17-5-2024 18-5-2024		TLM1/2	
45.	Old Papers discussion	**1**	21-5-2024		**TLM1/3**	
46.	**Tutorial-11**	**1**	**22-5-2024**		**TLM1/3**	
47.	Old Papers discussion	**1**	23-5-2024		**TLM1/3**	
48.	Old Papers discussion	**1**	24-5-2024		**TLM1/3**	
49.	Old Papers discussion	**1**	25-5-2024		**TLM1/3**	
50.	Old Papers discussion	**1**	28-5-2024		**TLM1/3**	
51.	**Tutorial-12**	**1**	**29-5-2024**		**TLM1/3**	
52.	Old Papers discussion	**1**	30-5-2024		**TLM1/3**	
53.	**Slip Test**	**1**	31-5-2024		**TLM1/3**	
54.	**Slip Test**	**1**	1-6-2024		**TLM1/3**	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		
Mid-II from 3-6-2024 to 8-6-2024						

COURSE DELIVERY PLAN (LESSON PLAN-B/Sec)
(Commencement of Classwork: w.e.f. 13-2-2024)

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	12-2-2024		TLM1/2	
2.	Basic Concepts of passive elements of R, L, C and their V-I relations	1	13-2-2024		TLM1/2	
3.	Sources (dependent and independent)	1	14-2-2024		TLM1/2	
4.	Kirchoff's laws, Network reduction techniques (series, parallel, series - parallel, star-to-delta and delta-to-star transformation)	2	15-2-2024 16-2-2024		TLM1/2	
5.	**Tutorial-1**	**1**	**19-2-2024**		**TLM3**	
6.	Source transformation technique	1	20-2-2024		TLM1/2	
7.	Nodal analysis to DC networks with dependent and independent voltage and current sources	**2**	21-2-2024 22-2-2024		TLM1/2	
8.	Mesh analysis to DC networks with dependent and independent voltage and current sources	2	23-2-2024 26-2-2024		TLM1/2,	
9.	**Additional Problems**	**2**	27-2-2024 28-2-2024		**TLM1**	
10.	**Tutorial-2/ GATE questions**	**1**	**29-2-2024**		**TLM3**	
11.	**Quiz-1**	**1**	**1-3-2024**		**TLM3**	
No. of classes required to complete UNIT-I: 15				**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	4-3-2024		TLM1/2	
13.	Faraday's laws of electromagnetic induction – concept of self and mutual inductance,	1	5-3-2024		TLM1/2	
14.	**Tutorial-3**	**1**	**6-3-2024**		**TLM3**	
15.	Dot convention – coefficient of coupling and composite magnetic	1	7-3-2024		TLM1/2	

	circuit					
16.	Analysis of series and parallel magnetic circuits	2	11-3-2024 12-3-2024		TLM1/2	
17.	**Tutorial-4/ GATE questions**	**1**	**13-3-2024**		**TLM1/3**	
18.	**Additional Problems**	**2**	14-3-2024 **15-3-2024**		**TLM1**	
No. of classes required to complete UNIT-II: 9				**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	18-3-2024 19-3-2024		TLM1/2	
20.	**Tutorial-5**	**1**	**20-3-2024**		**TLM3**	
21.	Representation of a sine function, concept of phasor, phasor diagrams	1	21-3-2024 22-3-2024		TLM1/2	
22.	Node and mesh analysis. Steady state analysis of R,L and C circuits to sinusoidal excitations	2	26-3-2024		TLM1/2	
	Mid-I from 1-4-2024 to 6-4-2024					
23.	**Tutorial-6**	**1**	**27-3-2024**		**TLM3**	
24.	Response of pure resistance, inductance, capacitance, Series RL circuit, series RC circuit, series RLC circuit	2	28-3-2024		TLM1/2	
25.	**GATE questions**	**1**	**8-4-2024**		**TLM1/3**	
26.	Parallel RL circuit, parallel RC circuit.	2	10-4-2024 12-4-2024		TLM1/2	
27.	**Additional Problems**	**1**	15-4-2024		**TLM1**	
28.	**Quiz-2**	**1**	16-4-2024		**TLM1/2**	
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

UNIT-IV: RESONANCEAND 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	18-4-2024		TLM1/2	
30.	Q-factor ,selectivity and bandwidth, expression for half power frequencies	1	19-4-2024		TLM1/2	
31.	Parallel resonance,:Q-factor, selectivity and bandwidth	**1**	22-4-2024		TLM1/2	
32.	**Tutorial-7**	**1**	**24-4-2024**		**TLM3**	
33.	Locus diagram: RL, RC ,RLC	**2**	23-4-2024 25-4-2024		TLM1/2	

	with R,L and C variables.					
34.	**Additional Problems**	**2**	26-4-2024 **29-4-2024**		**TLM1**	
35.	**GATE questions**	**1**	**30-4-2024**		**TLM1/3**	
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.	**Tutorial-8**	**1**	**1-5-2024**		**TLM3**	
37.	Superposition theorem	1	2-5-2024		TLM1/2	
38.	Thevenin's theorem/Nortan's theoerem	**1**	3-5-2024		TLM1/2	
39.	Maximum Power Transfer theorem	1	6-5-2024		TLM1/2	
40.	Reciprocity theorem	1	7-5-2024		TLM1/2	
41.	**Tutorial-9**	**1**	**8-5-2024**		**TLM3**	
42.	Millman's theorem and compensation theorem	2	9-5-2024 10-5-2024		TLM1/2	
43.	**Additional Problems**	**2**	13-5-2024 14-5-2024		**TLM1**	
44.	**Tutorial-10**	**1**	**15-5-2024**		**TLM3**	
45.	Old Papers discussion	1	16-5-2024		TLM1/3	
46.	Old Papers discussion	1	17-5-2024		TLM1/3	
47.	Old Papers discussion	1	20-5-2024		TLM1/3	
48.	Old Papers discussion	1	21-5-2024		TLM1/3	
49.	**Tutorial-11**	**1**	**22-5-2024**		**TLM3**	
50.	Old Papers discussion	1	23-5-2024		TLM1/3	
51.	Old Papers discussion	1	24-5-2024		TLM1/3	
52.	Old Papers discussion	1	27-5-2024		TLM1/3	
53.	Old Papers discussion	1	28-5-2024		TLM1/3	
54.	**Tutorial-12**	**1**	**29-5-2024**		**TLM3**	
55.	**Slip Test**	**1**	**30-5-2024**		**TLM1/3**	
56.	**Slip Test**	**1**	**31-5-2024**		**TLM1/3**	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		
Mid-II from 3-6-2024 to 8-6-2024						

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.M.UmaVani	Dr.M.UmaVani	Dr.P.Sobha Rani	Dr.J.S.V.Prasad
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Lakshmi V R BabuSyamala
Course Name & Code **:** Chemistry Lab & 23FE52
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech./Sem-II/EEE-A **A.Y. :**2023-24

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: 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): Section-A

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Engineeringchemistry lab	3	19-02-2024		TLM1		
2.	Preparation of a Bakelite	3	26-02-2024		TLM4	CO1	
3.	Determination of amount of HCl using standard Na_2CO_3 solution	3	04-03-2024		TLM4	CO1	
4.	Estimation of Ferrous Iron by Dichrometry	3	11-03-2024		TLM4	CO1	
5.	Estimation of Ferrous Iron by Permanganometry	3	18-03-2024		TLM4	CO1	
6.	Determination of Strength of an acid in Pb-Acid battery	3	08-04-2024		TLM4	CO1	
7.	Alkalinity	3	15-04-2024		TLM4	CO1	
8.	Estimation of total hardness	3	22-04-2024		TLM4	CO1	
9.	Conductometric titration of weak acid vs. strong base	3	29-04-2024		TLM4	CO2	
10.	Conductometric titration of strong acid vs. strong base	3	06-05-2024		TLM4	CO5	
11.	Finding pH of water sample	3	13-05-2024		TLM4	CO1	
12.	Internal Exam	3	20-05-2024 & 27-05-2024		TLM4	CO1	
	Total						

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

Part - C

EVALUATION PROCESS:

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

(a) Continuous Internal Evaluation(CIE):

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

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

PROGRAMME OUTCOMES (POs):

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

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. Lakshmi V R Babu Syamala**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.A.Rami Reddy**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.VijayaDasaradha
Course Name & Code **:** Chemistry Lab&23FE52
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech/I-sem/EEE-B **A.Y. :**2023-24

Pre requisites: Nil

Course Educational Objective:

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

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

CO1: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. (Analyze)
CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. (Apply)
CO3: Measure the strength of acid present in Pb-Acid battery. (Apply)
CO4: Determine the cell constant and conductance of solutions. (Apply)
CO5: Analyze organic compounds by using UV-Visible and IR spectroscopy. (Apply)

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

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

Bos Approved Lab Manual

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

S.No.	Experiment	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome Cos	HOD Sign Weekly
1.	Introduction to Engineering chemistry lab	3	17-02-2024		TLM1		
2.	Preparation of a Bakelite	3	24-02-2024		TLM4	CO1	
3.	Determination of amount of HCl using standard Na_2CO_3 solution	3	02-03-2024		TLM4	CO1	
4.	Determination of Strength of an acid in Pb-Acid battery	3	09-03-2024		TLM4	CO1	
5.	Estimation of Ferrous Iron by Dichrometry	3	16-03-2024		TLM4	CO1	
6.	Conductometric titration of strong acid vs. strong base	3	23-03-2024		TLM4	CO1	
7.	Conductometric titration of weak acid vs. strong base	3	30-03-2024		TLM4	CO1	
8.	Potentiometry - determination of redox potentials and emfs	3	13-04-2024		TLM4	CO1	
9.	Preparation of nanomaterials by precipitation method	3	20-04-2024		TLM4	CO2	
10.	Verify Lambert-Beer's law	3	27-04-2024		TLM4	CO4	
11.	Wavelength measurement of sample through UV-Visible Spectroscopy	3	04-05-2024		TLM4	CO4	
12.	Identification of simple organic compounds by IR	3	11-05-2024		TLM4	CO4	
13.	Revision	3	18-05-2024		TLM4	CO4	
14.	Revision	3	25-05-2024		TLM4	CO4	
15.	Internal Exam	3	01-06-2024		TLM4	CO4	
	Total						

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

Part - C

EVALUATION PROCESS:

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

(a) Continuous Internal Evaluation(CIE):

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

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

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

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

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr.S.VijayaDasaradha	Dr.V.Parvathi	Dr.V.Parvathi	Dr.A.Rami Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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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. :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		16-02-2024	DM5
2.	Week2: Problem-solving using Algorithms and Flow charts.	03		23-02-2024	DM5
3.	Week3: Exercise Programs on Variable types and type conversions	03		01-03-2024	DM5
4.	Week4: Exercise Programs on Operators and the precedence and as associativity.	03		15-03-2024	DM5
5.	Week5: Exercise Programs on Branching and logical expressions	03		22-03-2024	DM5
6.	Week6: Exercise Programs on Loops, while and for loops	03		12-04-2024	DM5
7.	Week7: Exercise Programs on 1 D Arrays & searching.	03		19-04-2024	DM5
8.	Week8: Exercise Programs on2 D arrays, sorting and Strings.	03		26-04-2024	DM5
9.	Week9: Exercise Programs on Pointers, structures and dynamic memory allocation	03		03-05-2024	DM5
10.	Week10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	03		10-05-2024	DM5
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent, Recursion, the structure of recursive calls	03		17-05-2024	DM5
12.	Week 12: Exercise Programs on Call by reference, dangling pointers, File handling.	03		24-05-2024	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.
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. J. S. V. Prasad**
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.
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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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. J. S. V. Prasad**
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONIC ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. L. Prabhu / Mr. Uma Maheswar Reddy

Course Name &	**:** Engineering Workshop & 23ME51	**Regulation**	: R23
L-T-P Structure	**: 0-0-3**	**Credits**	: 1.5
Program/Sem/Sec	**:** B. Tech/I/A/EEE	**A.Y.**	: 2023-24

PREREQUISITE: Nil

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

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

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

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

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

Textbooks:

T1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.

T2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

Reference Books:

R1. LBRCE Workshop Lab Manual.

R2. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition.

R3. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.

R4. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakash an, 2021-22.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

Si.No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	CYCLE-I					
1.	Introduction to Lab	3	15-02-2024		TLM4	
2.	Dove Tail Joint	3	22-02-2024		TLM4	
3.	Corner Lap Joint	3	29-02-2024		TLM4	
4.	T-Fitting	3	07-03-2024		TLM4	
5.	V-Fitting	3	14-03-2024		TLM4	
6.	Two Laps in Series and Parallel Connection with One Way Switch	3	21-03-2024		TLM4	
7.	Florescent Lamp and Calling Bell Circuit	3	28-03-2024		TLM4	
	CYCLE-II					
8.	Preparation of Pipe Layout	3	18-04-2024		TLM4	
9.	Pipe Threading	3	25-04-2024		TLM4	
10.	Preparation of Rectangular Tray	3	02-05-2024		TLM4	
11.	Preparation of Open Scoop	3	09-05-2024		TLM4	
12.	Preparation Of S-Hook	3	16-05-2024		TLM4	
13.	Preparation of chisel,	3	23-05-2024		TLM4	
14.	Repetition	3	23-05-2024		TLM4	
15.	Internal Lab Exam	3	30-05-2024		-----	
No. of classes required to complete				**No. of classes taken:**		

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

TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To provide students with sound mathematical, engineering, and multidisciplinary knowledge to solve Aerospace and Allied Engineering
PEO 2	To prepare students to excel in higher education programs and to succeed in industry/academia profession.
PEO 3	To inculcate ethical attitude, leadership qualities, problem solving abilities and life-long learning for a successful professional career.

PROGRAMME OUTCOMES (POs):

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures, and Flight Dynamics in Aerospace vehicle design.
PSO 2	To prepare the students to work effectively in Aerospace and Allied Engineering organizations.

	Course Instructor	**Module Coordinator**	**Head of the Department**
Signature			
Name of the Faculty	Dr. L. Prabhu	Mr. I DAKSHNA MURTHY	Dr. P. LOVARAJU

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

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

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : Engineering Workshop, 20ME51

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	13/02/2024		TLM8	R1	
2	Experiment-1	3	20/02/2024		TLM8	R1	
3	Experiment-2	3	27/02/2024		TLM8	R1	
4	Experiment-3	3	05/03/2024		TLM8	R1	
5	Experiment-4	3	12/03/2024		TLM8	R1	
6	Experiment-5	3	26/03/2024		TLM8	61	
I-Mid Examinations (01.04.2024 to 06.04.2024)							
7	Experiment-6	3	16/04/2024		TLM8	R1	
8	Experiment-7	3	23/04/2024		TLM8	R1	
9	Experiment-8	3	30/04/2024		TLM8	R1	
10	Repetition lab	3	07/05/2024		TLM8		
11	Viva voce	3	14/05/2024		TLM6		
12	Viva voce	3	21/05/2024		TLM6		
13	Lab Internal	3	28/05/2024		TLM6		

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (BATCH-B2)

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	16/04/2024		TLM8	R1	
2	Experiment-1	3	23/04/2024		TLM8	R1	
3	Experiment-2	3	27/02/2024		TLM8	R1	
4	Experiment-3	3	05/03/2024		TLM8	R1	
5	Experiment-4	3	12/03/2024		TLM8	R1	
6	Experiment-5	3	26/03/2024		TLM8	61	
I-Mid Examinations (01.04.2024 to 06.04.2024)							
7	Experiment-6	3	15/04/2024		TLM8	R1	
8	Experiment-7	3	22/04/2024		TLM8	R1	

9	Experiment-8	3	30/04/2024		TLM8	R1	
10	Repetition lab	3	07/05/2024		TLM8		
11	Viva voce	3	14/05/2024		TLM6		
12	Viva voce	3	21/05/2024		TLM6		
13	Lab Internal	3	28/05/2024		TLM6		

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	12-02-2024	06-04-2024	8W
I Mid Examinations	01-04-2024	06-04-2024	1W
II Phase of Instructions	08-04-2024	01-06-2024	8W
II Mid Examinations	03-06-2024	08-06-2024	1W
Preparation and Practical's	10-06-2024	15-06-2024	1W
Semester End Examinations	17-06-2024	29-06-2024	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: B-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B11	23761A0260-267	08	B21	23761A0289-296	08
B12	23761A0268-274	07	B22	23761A0297-2A3	07
B13	23761A0275-281	07	B23	23761A02A4-2B0	07
B14	23761A0282-288	07	B24	23761A02B1-2B7	07

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08
B11	C1	C2	F1	F2	P1	P2	E1	E2
B12	C2	C1	F2	F1	P2	P1	E2	E1
B13	F1	F2	C1	C2	E1	E2	P1	P2
B14	F2	F1	C2	C1	E2	E1	P2	P1
B21	C1	C2	F1	F2	P1	P2	E1	E2
B22	C2	C1	F2	F1	P2	P1	E2	E1
B23	F1	F2	C1	C2	E1	E2	P1	P2
B24	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-**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

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF EEE

COURSE HANDOUT

Name of Course Instructor(s): 1.Dr. M. Uma Vani, 2.Ms. Venkata Lakshmi
Course Name & Code : ELECTRICAL CIRCUITS LAB
L-T-P Structure : 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech/II/A **A.Y.: 2023-24**
PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVE (CEO): This laboratory course enables the students to demonstrate the design and analysis of electric circuits in day-to-day life.

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
CO2	Design resonance circuit for given specifications
CO3	Analyze the RL and RC circuits with respect to parameter variation using locus diagrams
CO4	Determine self, mutual inductances and coefficient of coupling values, parameters of choke coil

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

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

Electrical Circuits Laboratory Lesson Plan

Date:14-2-2024

Objective(s):

- To apply theoretical knowledge of electrical circuits to real-world scenarios through hands-on experiments.
- To provide EEE students with hands-on experience in electrical circuit experiments using simulation software tools.

List of Experiments:

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

Note: Over and above the curriculum, students are motivated to perform the listed experiments using the MATLAB software.

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DEPARTMENT OF EEE

A.Y. 2023-24

Lesson Plan: Sec-A/ BATCH-I

S. No.	List of Experiments	No. of Lab Slots Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	**Cycle-I Lab Demonstration**	1	14-2-2024		TLM 1/4/5	
2.	Experiment-1	1	21-2-2024		TLM4/5	
3.	Experiment-2	1	28-2-2024		TLM4/5	
4.	Experiment-3	1	6-3-2024		TLM4/5	
5.	Experiment-4	1	13-3-2024		TLM4/5	
6.	Experiment-5	1	20-3-2024		TLM4/5	
7.	**Cycle-II Lab Demonstration**	1	27-3-2024		TLM4/5	
8.	Experiment-6	1	10-4-2024		TLM4/5	
9.	Experiment-7	1	24-4-2024		TLM4/5	
10.	Experiment-8	1	1-5-2024		TLM4/5	
11.	Experiment-9	1	8-5-2024		TLM4/5	
12.	Experiment-10	1	15-5-2024		TLM4/5	
13.	**Repetition class**	**1**	22-5-2024		TLM4/5	
14.	**Internal Lab Exam**	1	29-5-2024		TLM4/5	
No. of lab slots required to complete 10 experiments: 11 (Including Demo class)				**No. of lab slots taken:**		

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	1.Dr. M. Uma Vani 2.Ms. Venkata Lakshmi.	Dr. M. Uma Vani	Dr.P.Sobha Rani	Dr.J.S.V.Prasad
Signatures				

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DEPARTMENT OF EEE

A.Y. 2023-24

Lesson Plan: Sec-B/ Batch-I

S. No.	List of Experiments	No. of Lab Slots Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1	**EC Lab Demonstration**	1	16-2-2024		TLM 1/4/5	
2.	Experiment-1	1	23-2-2024		TLM4/5	
3.	Experiment-2	1	1-3-2024		TLM4/5	
4.	Experiment-3	1	15-3-2024		TLM4/5	
5.	Experiment-4	1	22-3-2024		TLM4/5	
6.	Experiment-5	1	12-4-2024		TLM4/5	
7.	Experiment-6	1	19-4-2024		TLM4/5	
8.	Experiment-7	1	26-4-2024		TLM4/5	
9.	Experiment-8	1	3-5-2024		TLM4/5	
10.	Experiment-9	1	10-5-2024		TLM4/5	
11.	Experiment-10	1	17-5-2024		TLM4/5	
12.	**Repetition class**	1	24-5-2024		TLM4/5	
13.	**Internal Lab Exam**	**1**	31-5-2024		TLM4/5	
No. of lab slots required to complete 10 experiments: 11 (Including Demo class)				**No. of lab slots taken:**		

Title	Course Instructor	Course Coordinator	Module Coordinator	HoD
Name of the Faculty	1 Dr. M. Uma Vani. 2.Ms. Venkata Lakshmi	Dr. M. Uma Vani	Dr.P.Sobha Rani	Dr.J.S.V.Prasad
Signatures				