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.
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DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

PROGRAM	**:** I B. Tech., II-Sem., CIVIL
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** K. N. V. Lakshmi
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	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	14-02-2024		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	21-02-2024		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	28-02-2024		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	06-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
20.	Finding Particular Integral, P.I for e^{ax+b}	1	12-03-2024		TLM1	CO1	T1,T2	

21.	P.I for Cos bx, or sin bx	1	13-03-2024		TLM1	CO1	T1,T2	
22.	P.I for polynomial function	1	15-03-2024		TLM1	CO1	T1,T2	
23.	P.I for $e^{ax+b}v(x)$	1	16-03-2024		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	18-03-2024		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	19-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	20-03-2024		TLM1	CO1	T1,T2	
27.	Simultaneous linear equations	1	22-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	23-03-2024		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	26-03-2024		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	27-03-2024		TLM1	CO1	T1,T2	
31.	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
32.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
33.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary functions	1	12-04-2024		TLM1	CO2	T1,T2	
35.	Solving of PDE	1	15-04-2024		TLM1	CO2	T1,T2	
36.	Lagrange's Method	1	16-04-2024		TLM1	CO2	T1,T2	
37.	Lagrange's Method	1	19-04-2024		TLM1	CO2	T1,T2	
38.	Homogeneous Linear PDE with constant coefficients	1	20-04-2024		TLM1	CO2	T1,T2	
39.	TUTORIAL - III	1	22-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		08			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction to UNIT IV	1	23-04-2024		TLM1	CO3	T1,T2	
41.	Vector Differentiation	1	24-04-2024		TLM1	CO3	T1,T2	
42.	Gradient	1	26-04-2024		TLM1	CO3	T1,T2	

43.	Directional Derivative	1	27-04-2024		TLM1	CO3	T1,T2	
44.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
45.	Divergence	1	30-04-2024		TLM1	CO3	T1,T2	
46.	Curl	1	01-05-2024		TLM1	CO3	T1,T2	
47.	Problems	1	03-05-2024		TLM1	CO3	T1,T2	
48.	Solenoidal fields, Irrotational fields, potential surfaces	1	04-05-2024		TLM1	CO3	T1,T2	
49.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
50.	Laplacian, second order operators	1	07-05-2024		TLM1	CO3	T1,T2	
51.	Vector Identities	1	08-05-2024		TLM1	CO3	T1,T2	
52.	Vector Identities	1	10-05-2024		TLM1	CO3	T1,T2	
53.	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	15-05-2024		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.	Volume Integral	1	21-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	22-05-2024		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 Theorem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	28-05-2024		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	31-05-2024 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-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

K. N. V. Lakshmi	Dr. K. R. Kaviths	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	**: Mrs.J.GeethaRenuka**	
Course Name & Code	**: Introduction to Programming (23CS01)**	
L-T-P Structure	**: 3-0-0**	**Credits: 3**
Program/Sem/Sec	**: B.Tech.–IT /II Sem**	**A.Y.: 2023-24**

PRE-REQUISITE: Fundamentals of Mathematics.

COURSE EDUCATIONAL OBJECTIVE (CEO):

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

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

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

1 – Low **2 –** Medium **3 –** High

TEXTBOOKS:

T1: The C Programming Language", Brian W. Kernighan and Dennis M. Ritchie, Prentice Hall, 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	14-02-2024		**TLM1/ TLM2**	
2.	History of Computers	1	15-02-2024		**TLM1/ TLM2**	
3.	Basic organization of a computer: ALU, input-output units.	2	16-02-2024 17-02-2024		**TLM1/ TLM2**	
4.	Memory, program counter	1	19-02-2024		**TLM1/ TLM2**	
5.	Introduction to Programming Languages,	1	21-02-2024		**TLM1/ TLM2**	
6.	Basics of a Computer Program-Algorithms	1	22-02-2024		**TLM1/ TLM2**	
7.	Flowcharts (Using Dia Tool), pseudo code.	1	23-02-2024		**TLM1/ TLM2**	
8.	Introduction to Compilation and Execution	1	24-02-2024		**TLM1/ TLM2**	
9.	Primitive Data Types	2	26-02-2024 28-02-2024		**TLM1/ TLM2**	
10.	Variables, and Constants, Basic Input and Output operations	2	29-02-2024 01-03-2024		**TLM1/ TLM2**	
11.	Type Conversion, and Casting	1	02-03-2024		**TLM1/ TLM2**	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	04-03-2024		**TLM1/ TLM2**	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	06-03-2024		**TLM1/ TLM2**	
14	Time and space complexities of algorithms.	1	07-03-2024		**TLM1/ TLM2**	
No. of classes required to complete UNIT – I: 17				**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.	Conditional Statements	1	09-03-2024		**TLM1/ TLM2**	
16.	if, if-else, nested if-else , else-if ladder	2	11-03-2024 13-03-2024		**TLM1/ TLM2**	
17.	switch	1	14-03-2024		**TLM1/ TLM2**	
18.	Example programs on Decision Making and Branching	2	15-03-2024 16-03-2024		**TLM1/ TLM2**	
19.	Loops: while , Example programs	2	18-03-2024 20-03-2024		**TLM1/ TLM2**	
20.	do-while, for	1	21-03-2024		**TLM1/ TLM2**	
21.	Example programs on Loops	1	22-03-2024		**TLM1/ TLM2**	
22.	Break and Continue	1	23-03-2024		**TLM1/ TLM2**	
23.	Example programs on Patterns	2	26-03-2024 27-03-2024		**TLM1/ TLM2**	
24.	Revision	1	30-03-2024			
No. of classes required to complete UNIT – II: 14				**No. of classes taken:**		

UNIT – III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Arrays Introduction, Declaration	1	08-04-2024		TLM1/ TLM2	
26.	Array indexing, Accessing elements	1	12-04-2024		TLM1/ TLM2	
27.	memory model	1	13-04-2024		TLM1/ TLM2	
28.	programs with array of integers	1	15-04-2024		TLM1/ TLM2	
29.	Introduction to two dimensional arrays	1	17-04-2024 18-04-2024		TLM1/ TLM2	
30.	2D Array indexing, Accessing elements	1	19-04-2024		TLM1/ TLM2	
31.	programs with 2D arrays	1	20-04-2024		TLM1/ TLM2	
32.	Introduction to Strings	1	22-04-2024		TLM1/ TLM2	
33.	Reading and Writing Operations on Strings	1	24-04-2024		TLM1/ TLM2	
34.	String Handling Functions	2	25-04-2024 26-04-2024		TLM1/ TLM2	
35.	Example Programs using Strings	2	27-04-2024 29-04-2024		TLM1/ TLM2	
No. of classes required to complete UNIT – III: 12				**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
36.	Introduction to Pointers	1	1-05-2024		TLM1/ TLM2	
37.	dereferencing and address operators	1	02-05-2024		TLM1/ TLM2	
38.	pointer and address arithmetic	1	03-05-2024		TLM1/ TLM2	
39.	array manipulation using pointers	2	04-05-2024 06-05-2024		TLM1/ TLM2	
40.	User-defined data types	1	08-05-2024		TLM1/ TLM2	
41.	Structures , Definition and Initialization	2	09-05-2024 10-05-2024		TLM1/ TLM2	
42.	Example programs	1	11-05-2024		TLM1/ TLM2	
43.	Unions	2	13-05-2024 15-05-2024		TLM1/ TLM2	
44.	Example programs	1	16-05-2024		TLM1/ TLM2	
45.	Revision	1	17-05-2024		TLM1/ TLM2	
No. of classes required to complete UNIT – IV: 13				**No. of classes taken:**		

UNIT – V:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Introduction to Functions	1	18-05-2024		TLM1/ TLM2	
47.	Function Declaration and Definition	1	20-05-2024		TLM1/ TLM2	
48.	Function call Return Types	1	21-05-2024		TLM1/ TLM2	
49.	Arguments	1	22-05-2024		TLM1/ TLM2	
50.	modifying parameters inside functions using pointers	2	24-05-2024 25-05-2024		TLM1/ TLM2	
51.	arrays as parameters	1	27-05-2024		TLM1/ TLM2	

52.	Scope and Lifetime of Variables	1	29-05-2024		**TLM1/ TLM2**	
53.	Introduction to Files	1	30-05-2024		**TLM1/ TLM2**	
54.	Basics of File Handling	1	31-05-2024		**TLM1/ TLM2**	
55.	Operations on Files	1	01-06-2024		**TLM1/ TLM2**	
No. of classes required to complete UNIT – V: 11				**No. of classes taken:**		

Content beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
56.	Application Development using C	1	01-06-2024		**TLM1/ TLM2**	

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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 1	Organize, Analyze and Interpret the data to extract meaningful conclusions
PSO 2	Design, Implement and Evaluate a computer-based system to meet desired needs.
PSO 3	Develop IT application services with the help of different current engineering tools.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mrs.J.GeethaRenuka**	**Dr. Y. Vijay Bhaskar Reddy**	**Dr. K. Phaneendra**	**Dr. B. Srinivas Rao**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.R.ANJANEYULU NAIK
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Branch/Sem/Sec: B.Tech/CIVIL **A.Y.:** 2023-24

Pre-requisites: Physics
Course Educational Objective:

To expose to the field of electrical & electronics engineering, laws and principles of electrical/ electronic engineering and to acquire fundamental knowledge in the relevant field.

- To teach the fundamentals of semiconductor devices and its applications, principles of digital electronics.

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

	PART-A
CO1	Extract electrical variables of AC & DC circuits usin fundamental laws. **(Understand)**
CO2	Understand the operation of electrical machines and measuring instruments. **(Understand)**
CO3	Classify various energy resources, safety measures and interpret electricity bill generation in electrical sysems.
	PART-B
CO4	Interpret the characteristics of various semiconductor devices. **(Knowledge)**
CO5	Infer the operation of rectifiers, amplifiers. **(Understand)**
CO6	Contrast various logic gates, sequential and combinational logic circuits. **(Understand)**

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

1. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
2. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DC & AC 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.	Electrical circuit elements	1	12-02-2024		TLM1	
2.	Ohm's Law and its limitations	1	13-02-2024		TLM1	
3.	KCL & KVL	1	14-02-2024		TLM1	
4.	series, parallel, series-parallel circuits	1	15-02-2024		TLM1	
5.	Problems	1	16-02-2024		TLM1	
6.	Super Position theorem	1	19-02-2024		TLM1	
7.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	21-02-2024		TLM2	
8.	average value, RMS value, form factor, peak factor	1	22-02-2024		TLM1	
9.	RLC Circuits	1	23-02-2024		TLM1	
10.	Impedance, Power	1	26-02-2024		TLM1	
11.	Problems	1	27-02-2024		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT – II: MACHINES AND MEASURING INSTRUMENTS

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.	Construction, principle and operation of (i) DC Motor, (ii) DC Generator.	1	04-03-2024		TLM2	
13.	Single Phase Transformer	1	05-03-2024		TLM2	
14.	Three Phase Induction Motor	1	06-03-2024		TLM2	
15.	Alternator	1	07-03-2024		TLM2	
16.	Applications of electrical machines	1	11-03-2024		TLM2	
17.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	12-03-2024		TLM2	
18.	Moving Iron (MI) Instruments	1	13-03-2024		TLM2	
19.	Wheat Stone bridge	1	12-03-2024		TLM2	
20.	Problems	1	13-03-2024		TLM2	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

UNIT – III: ENERGY RESOURCES, ELECTRICITY BILL & SAFETY MEASURES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Conventional and non-conventional energy resources	1	14-03-2024		TLM2	
22.	Hydel & Nuclear power generation	1	15-03-2024		TLM2	
23.	Solar & Wind power plants	1	19-03-2024		TLM2	
24.	Power rating of household appliances including air	1	20-03-2024		TLM2	

	conditioners, PCs, Laptops, Printers, etc.					
25.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	21-03-2024		TLM2	
26.	calculation of electricity bill for domestic consumers.	1	22-03-2024		TLM2	
27.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	26-03-2024		TLM2	
28.	Personal safety measures: Electric Shock	1	27-03-2024		TLM2	
29.	Earthing and its types& Safety Precautions	1	28-03-2024		TLM2	
No. of classes required to complete UNIT-III: 9				**No. of classes taken:**		

UNIT – IV: SEMICONDUCTOR DEVICES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction	1	08-04-2024		TLM1	
31.	Evolution of electronics – Vacuum tubes to nano electronics	1	10-04-2024		TLM2	
32.	PN Junction diode	1	15-04-2024		TLM2	
33.	Characteristics of PN Junction Diode	1	16-04-2024		TLM2	
34.	Zener Effect — Zener Diode and its Characteristics	1	18-04-2024		TLM2	
35.	Bipolar Junction Transistor	1	19-04-2024		TLM2	
36.	CB Configuration	1	22-04-2024		TLM2	
37.	CE Configuration	1	23-04-2024		TLM2	
38.	CC Configuration	1	24-04-2024		TLM2	
39.	Elementary Treatment of Small Signal CE Amplifier.	1	25-04-2024		TLM2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT – V: BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
40.	Introduction	1	26-04-2024		TLM1	
41.	Block diagram description of a dc power supply.	1	29-04-2024		TLM1	
42.	working of a full wave bridge rectifier	1	30-04-2024		TLM1	
43.	capacitor filter	1	01-05-2024		TLM1	
44.	working of simple zener voltage regulator	1	02-05-2024		TLM1	
45.	Block diagram of Public Address system	1	03-05-2024		TLM1	
46.	Circuit diagram and working of common emitter (RC coupled) amplifier	1	06-05-2024		TLM1	
47.	Frequency response.	1	07-05-2024		TLM1	
48.	Electronic Instrumentation	1	08-05-2024		TLM1	
49.	Block diagram of an electronic instrumentation system	1	09-05-2024		TLM1	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

UNIT – VI: DIGITAL ELECTRONICS

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.	Number Systems	1	10-05-2024		TLM2	
56.	Logic gates	1	13-05-2024		TLM1	
57.	BCD & XS-3 code	1	14-05-2024		TLM2	
58.	Gray and Hamming code	1	15-05-2024		TLM1	
59.	Basic theorems & Boolean Algebra	1	16-05-2024		TLM2	
61.	Logic diagrams using logic gates only	1	17-05-2024		TLM2	
62.	Combinational Vs Sequential circuits	1	20-05-2024		TLM1	
63.	Half & Full adder	1	22-05-2024		TLM1	
65.	Introduction to sequential circuits,	1	23-05-2024		TLM1	
66.	Flip flops- SR & D	1	24-05-2024		TLM2	
67.	Flip flops- JK & T	1	27-05-2024		TLM2	
68.	Registers & counters	1	28-05-2024		TLM1	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 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 (Units-IV, V, VI)	A2=5
II- Descriptive Examination (Units-IV, V, VI)	M2=15
II-Quiz Examination (Units-IV, V, VI)	Q2=10
Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr R.A.NAIK**	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
Signature				

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Mr. P. Mohanaganga Raju
Course Name & Code : Engineering Mechanics & 23ME02
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem : B. Tech / II-Sem **A.Y.:** 2023-24

PREREQUISITE: Engineering Physics, Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To get familiarized with different types of force systems.
- To draw accurate free body diagrams representing forces and moments acting on body to analyze equilibrium of system of forces.
- To teach the basic principles of center of gravity,centroid and moment of inertia and determine them for different simple and composite bodies.
- To apply the Work energy method to particle motion
- To Understand the kinematics and kinetics if translational and rotational motion of rigid bodies.

COURSE OUTCOMES (COs): On Completion of the course, student should be able to

CO1	Determine the resultant of coplanar concurrent and non-concurrent force systems. (**Apply-L3**).
CO2	Apply the Static equilibrium conditions to determine unknown planar force systems and determine the frictional forces for the bodies in contact. (**Apply-L3**).
CO3	Calculate the centroids, center of gravity and moment of inertia ofgeometrical shapes (**Apply-L3**).
CO4	Apply the principles of work energy and impulse-momentum to solve the problems of rectilinear and curvilinear motion of a particle. (**Apply-L3**).
CO5	Solve the problems involving the translational and rotational motion of rigid bodies. (**Apply-L3**)

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

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

TEXTBOOKS:

T1 S. S. Bhavikatti, Engineering Mechanics, 4thedition, New Age International (P) Ltd, 2012.
T2 N. H. Dubey, Engineering Mechanics, McGraw Hill, 2013

REFERENCE BOOKS:

R1 Ferdinand. L. Singer, Engineering Mechanics, 3rd edition, Harper – Collins, 1994
R2 B.Bhattacharya, Engineering Mechanics, 1stedition, Oxford University Press, 2008
R3 A.K.Tayal, Engineering Mechanics, 14thedition, 2ndreprint, Umesh Publications, 2012

R4 R.K.Bansal, Engineering Mechanics, 3rd edition, Laxmi Publications, 2016

R5 R.K.Rajput, A Text book of Applied Mechanics, Laxmi Publications, 2011.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: SYSTEM OF FORCES AND EQUILIBRIUM OF SYSTEM OF FORCES

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 Engineering Mechanics	1	12-2-24		TLM2	
2.	Course Outcomes, CEOs, POs, PEOs	1	14-2-24		TLM2	
3.	Basic terminology in Mechanics, laws of Mechanics	1	15-2-24		TLM,2	
4.	Force, Characteristics of Forces, Force Systems	1	16-2-24		TLM 1,2	
5.	Resolution and Composition of forces, Parallelogram, Triangle and Polygon Law of Forces	1	17-2-24		TLM1,2	
6.	Resultant of Coplanar Concurrent Force System-Problems	1	19-2-24		TLM1,2	
7.	Moment of a Force, Couple – Varignon's Theorem	1	21-2-24		TLM2	
8.	**Tutorial-1**	1	22-2-24		TLM3	
9.	Resultant of Coplanar Non-Concurrent Force System-Problems	1	23-2-24		TLM1,2	
10.	**EQUILIBRIUM OF SYSTEM OF FORCES**: Equilibrium equations of concurrent and non concurrent force system, Free Body Diagrams, Lami's Theorem	1	24-2-24		TLM1,2	
11.	Equilibrium of a rigid body subjected to coplanar concurrent forces	1	26-2-24		TLM2	
12.	Equilibrium of a rigid body subjected to non-concurrent forces- Problems.	1	28-2-24		TLM2	
13.	**Tutorial-2**	1	29-2-24		TLM3	
14.	Problems related to Connected Bodies, Roller problems	1	1-3-24		TLM1,2	
15.	Roller problems, Assignment -1/ Quiz-1	1	2-3-24		TLM2,3	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: FRICTION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	**FRICTION:** Introduction to Friction, advantages, disadvantages	1	4-3-24		TLM1, 2	
17.	Types of Friction, limiting friction, Laws of Friction	1	6-3-24		TLM1,2	
18.	Co-efficient of Friction, Angle of Friction – Angle of Repose	1	7-3-24		TLM1,2	
19.	Blocks resting on horizontal plane	1	11-3-24		TLM1,2	
20.	Problems on Blocks resting on horizontal plane	1	13-3-24		TLM1	
21.	One Block resting on another block, Blocks resting on Inclined plane	1	14-3-24		TLM1,2	

22.	Problems--Blocks resting on Inclined plane	1	15-3-24		TLM2	
23.	Problems--Blocks resting on Inclined plane	1	16-3-24		TLM2	
24.	**Tutorial-3**	1	18-3-24		TLM3	
25.	Problems--Blocks resting on Inclined plane Assignment -II/ Quiz-I1	1	20-3-24		TLM2,3	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: CENTROID AND AREA MOMENT OF INERTIA; CENTRE OF GRAVITY AND MASS MOMENT OF INERTIA

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	**CENTROID:** Introduction**,** Concept, Applications, axis of symmetry	1	21-3-24		TLM2	
27.	Centroid of simple figures from basic principles	1	22-3-24		TLM1,2	
28.	Centroid of simple composite sections	1	23-3-24		TLM2	
29.	**AREA MOMENT OF INERTIA:** Moment of inertia, Theorems of Moment of Inertia	1	25-3-24		TLM2	
30.	Determination of Moment of Inertia of Rectangle, Circle, Hollow Circle	1	27-3-24		TLM2	
31.	Determination of Moment of Inertia of Semi Circle, Triangle from basic principles	1	28-3-24		TLM2	
32.	Problems on moment of inertia	1	30-3-24		TLM1	
33.	**Tutorial – 4** - Area Moment of Inertia-problems	1	8-4-24		TLM3	
34.	Problems on Area moment of inertia	1	10-4-24		TLM1	
35.	Unit-III Revision (Centroid & Area Moment of Inertia)	1	12-4-24		TLM1	
36.	**CENTRE OF GRAVITY**: Centre of gravity of solid cylinder	1	15-4-24		TLM2	
37.	Centre of gravity of right circular cone, hemi sphere	1	18-4-24		TLM1,2	
38.	Centre of gravity of composite bodies	1	19-4-24		TLM1,2	
39.	**MASS MOMENT OF INERTIA:** Introduction**,** Radius of gyration	1	20-4-24		TLM2	
40.	Determination of Mass Moment of Inertia of Uniform Rod, Rectangular Plate, Circular Plate-problems	1	22-4-24		TLM1,2	
41.	**Tutorial-5 &** Assignment -III/ Quiz-III	1	24-4-24		TLM3	
42.	Determination of Mass Moment of Inertia of Solid Sphere, Solid Cylinder--problems	1	25-4-24		TLM1	
43.	Unit-III Revision	1	26-4-24		TLM1	
No. of classes required to complete UNIT-III: 20				**No. of classes taken:**		

UNIT-IV: RECTILINEAR AND CURVILINEAR MOTION OF A PARTICLE

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 Kinematics, **g**eneral principles in dynamics, types of motion, rectilinear motion	1	27-4-24		TLM1,2	
45.	Motion with Uniform Velocity - Problems	1	29-4-24		TLM1,2	
46.	Motion with Uniform Acceleration derivations- problems	1	1-5-24		TLM1,2	
47.	**Tutorial-6**	1	2-5-24		TLM1,2	
48.	Motion with Uniform Acceleration-Problems	1	3-5-24		TLM3	
49.	Motion with varying acceleration - Problems	1	4-5-24		TLM2	
50.	D-Alembert's principle –	1	6-5-24		TLM2	
51.	Work Energy method and applications to particle Impulse momentum method	1	8-5-24		TLM1,2	
52.	**Tutorial-7 &** Assignment -III/ Quiz-III	1	9-5-24		TLM3	
53.	Uniformly accelerated rotation-problems	1	10-5-24		TLM1,2	
54.	Unit-IV Revision	1	13-5-24		TLM1	
No. of classes required to complete UNIT-IV: 11				**No. of classes taken:**		

UNIT-V: RIGID BODY MOTION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
55.	Introduction to Kinematics and kinetics of rigid bodies in translation	1	15-5-24		TLM1,2	
56.	Kinetics of rigid bodies Rotating about Fixed Axis, Derivations	1	16-5-24		TLM1,2	
57.	**Tutorial-8**	1	17-5-24		TLM3	
58.	Work Energy method	1	18-5-24		TLM1,2	
59.	Impulse momentum method	1	20-5-24		TLM2	
60.	Simple Applications	1	22-5-24		TLM1,2	
61.	**Tutorial-9**	1	23-5-24		TLM1,3	
62.	Fixed rotation of bodies, Assignment -V/ Quiz-V	1	24-5-24		TLM3	
63.	Curvilinear and general plane motion (Beyond Syllabus)	1	25-5-24		TLM1,2	
64.	Unit-V Revision	1	27-5-24		TLM2,3	
65.	Unit-III, IV, V Revision	1	29-5-24		TLM2,3	
66.	Unit-III, IV, V Revision	1	30-5-24		TLM1	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	P. Mohanaganga Raju	B. Ramakrishna	Dr. J. Venkateswara Rao
Signature			

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. V.Parvathi
Course Name & Code **:**Chemistry & 23FE06
L-T-P Structure **:3-0-0** **Credits:03**
Program/Sem/Sec : B.Tech/IIsem/ Civil **A.Y. :**2023-24

PREREQUISITE: Nil

Course Objectives

• 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 understand quality of water, fuels for various applications, polymers, electrochemistry and batteries
.
• To learn the basic concepts of surface chemistry and identify the significance of modern engineering materials.

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

CO1	Identify the troubles due to hardness of water and its maintenance in industrial applications. (**Understand**)
CO2	Apply Nernst equation in calculating cell potentials, compare batteries for different applications and outline the principles of corrosion for design and effective maintenance of various devices**.** **(**Understand**)**
CO3	Outline the importance of polymers and alternate fuels. (**Understand**)
CO4	Summarize the suitability of engineering materials like composites, refractories, lubricants, and building materials. (**Understand**)
CO5	Understand the concepts of collides, micelles and nanomaterials. (**Understand**)

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

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

Textbooks:

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

Reference: Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: STRUCTURE AND BONDING MODELS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Bridge Course	1	13 -02-2024		TLM1	
2.		1	15-02-2024		TLM1	
3.		1	16-02-2024		TLM1	
4.	Soft and hard water	1	17-02-2024		TLM1	
5.	Hardness concept contd…	1	20-02-2024		TLM1	
6.	Estimation of hardness of water by EDTA Method	1	22-02-2024		TLM1	
7.	Estimation of dissolved Oxygen	1	23-02-2024		TLM1	
8.	Priming, foaming,	1	24-02-2024		TLM1	
9.	scale and sludge	1	27-02-2024		TLM1	
10.	Caustic embrittlement,	1	29-02-2024		TLM1	
11	Specifications for drinking water, Bureau of Indian Standards(BIS) and World health organization(WHO) standards,	1	01-03-2024		TLM1	
12	Ion-exchange processes	1	02-03-2024		TLM1	
13	reverse osmosis (RO) and electrodialysis.	1	05-03-2024		TLM1	
14	Revision of unit I	1	09-03-2024		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.	Electrochemical cell, Nernst equation,	1	12-03-2024		TLM1	
2.	cell potential calculations	1	14-03-2024		TLM1	
3.	Zinc-air battery, Nickel-Cadmium (NiCad)	1	15-03-2024		TLM1	
4.	Lithium ion battery, Fuel cells-Basic concept, Hydrogen-oxygen Fuel cell.	1	16-03-2024		TLM1	
5.	Introduction to corrosion electrochemical theory of corrosion.	1	19-03-2024		TLM2	
6.	electrochemical theory of corrosion	1	21-03-2024		TLM2	
7.	differential aeration cell corrosion	1	22-03-2024		TLM2	
8.	galvanic corrosion, metal oxide formation by dry electrochemical corrosion	1	23-03-2024		TLM2	
9.	Factors affecting the corrosion	1	26-03-2024		TLM2	
10	electroplating and electro less plating	1	28-03-2024		TLM2	
11	Revision of unit II	1	30-03-2024		TLM2	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT-III: ELECTROCHEMISTRY AND APPLICATIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Mid I Analysis	1	08-04-2024			
2.	Introduction to polymers, functionality of monomers,	1	10-04-2024		TLM1	
3.	Mechanism of chain growth, step growth polymerization.	1	12-04-2024		TLM1	
4.	Thermoplastics and Thermo-setting plastics	1	13-04-2024		TLM1	
5.	Preparation, properties and applications of poly styrene. PVC Nylon 6,6	1	16-04-2024		TLM1	

	and Bakelite					
6.	Preparation, properties and applications Thiokol rubbers of Buna S, Buna N	1	18-04-2024		TLM1	
7.	Fuels – Types of fuels, calorific value of fuels	1	19-04-2024		TLM1	
8.	numerical problems based on calorific value; Analysis of coal (Proximate and Ultimate analysis)	1	20-04-2024		TLM1	
9	Liquid Fuels, refining of petroleum, Octane and Cetane number-	1	23-04-2024		TLM1	
10	Alternative fuels- propane, methanol, ethanol and bio fuel-bio diesel.	1	25-04-2024		TLM1	
11	Revision of unit III	1	26-04-2024		TLM1	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: POLYMER CHEMISTRY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Composites- Definition, Constituent	1	27-04-2024		TLM1	
2.	Classification- Particle, Fibre and Structural reinforced composites, properties and Engineering applications	1	30-04-2024		TLM1	
3.	Refractories- Classification, Properties,	1	02-05-2024		TLM1	
4.	Lubricants- Classification, Functions of lubricants,	1	03-05-2024		TLM1	
5.	Mechanism, Properties of lubricating oils – Viscosity, Viscosity Index	1	04-05-2024		TLM1	
6.	Flash point, Fire point, Cloud point, saponification and Applications.	1	07-05-2024		TLM1	
7.	Building materials- Portland Cement, constituents	1	09-05-2024		TLM1	

8.	Setting and Hardening of cement	1	10-05-2024		TLM1	
9	Revision of unit IV	1	11-05-2024		TLM1	
No. of classes required to complete UNIT-IV: 9				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.	Introduction to surface chemistry, colloids,	1	14-05-2024		TLM1	
2.	nanometals and nanometal oxides, micelle formation,	1	16-05-2024		TLM1	
3.	synthesis of colloids (Braggs Method),	1	17-05-2024		TLM1	
4.	chemical and biological methods of preparation of nanometals and metal oxides,	1	18-05-2024		TLM1	
5.	stabilization of colloids and nanomaterials by stabilizing agents,	1	21-05-2024		TLM1	
6.	ometals and metal oxides, stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Longmuir),	1	23-05-2024		TLM1	
7.	BET equation (no derivation) applications of colloids and nanomaterials – catalysis, medicine, sensors, etc	1	24-05-2024		TLM1	
8.	Revision of unit IV	1	25-05-2024		TLM1	
9	Instruction for SEE	1	28-05-2024		TLM1	
No. of classes required to complete UNIT-V: 9				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 nanomaterials in advanced technologies.	1	30-05-2024		TLM2	
2	Applications of polymers in advanced technologies.	1	31-05-2024		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 (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

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DEPARTMENT OF FRESHMANENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. V.Parvathi
Course Name & Code **:** Chemistry Lab&23FE54
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech/ II sem/ ECE B **A.Y. :**2023-24

Pre requisites: Nil

Course Educational Objective:

- To enable the students to analyze water samples and perform different types of volumetric titrations.
- To provides an overview of preparation of polymers, nanomaterials and analytical techniques.
- To measure the important parameters of fuels, lubricants and composition of cement.

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-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 Engineering chemistry lab	3	14-02-2024		TLM1		
2.	Demonstration of volumetric analysis	**3**	21-02-2024		TLM4	CO1	
3.	Preparation of a Bakelite	3	28-02-2024		TLM4	CO2	
4.	Determination of amount of HCl using standard Na2CO3 solution	3	06-03-2024		TLM4	CO1	
5.	Determination of Strength of an acid in Pb-Acid battery	3	13-03-2024		TLM4	CO3	
6.	Estimation of Ferrous Iron by Dichrometry	3	20-04-2024		TLM4	CO1	
7.	Conductometric titration of strong acid vs. strong base	3	27-04-2024		TLM4	CO4	
8.	Conductometric titration of weak acid vs. strong base	3	01-05-2024		TLM4	CO4	
9	Determination of alkalinity And conc of individual ions	3	08-05-2024		TLM4	CO1	
10.	Estimation of Ferrous Iron by permanganometry	3	15-05-2024		TLM4	CO1	
11.	Estimation of total hardness of water by EDTA method	3	22-05-2024		TLM4	CO2	
12.	Measurement of pH//Revision/ Experiment for absentees for regular lab.	3	29-05-2024		TLM4	CO4	
13	Internal Exam	3					

Part - C

EVALUATION PROCESS:

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

(a) Continuous Internal Evaluation(CIE):

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

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

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineeringsciences.
3. **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmentalconsiderations.
4. **Conduct investigations of complex problems**: Use research-based knowledge and 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 thelimitations.
6. **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineeringpractice.
7. **Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainabledevelopment.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineeringpractice.
9. **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinarysettings.

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

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

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DEPARTMENT OF AEROSPACE ENGINEERING

PART-A

Name of Course Instructor : **Mrs.GeethaRenuka**

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

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

Program/Sem/Sec : **B.Tech.–Civil /II Sem** **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.

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

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

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

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

TEXTBOOKS:

T1: Ajay Mittal, Programming in C: A practical approach, Pearson.

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

REFERENCE BOOKS:

R1: Brian W. Kernighan and Dennis M. Ritchie, The C Programming Language, Prentice-Hall of India

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):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Week 1: Familiarization with programming environment	3	13-02-2024		DM5	
2.	Week 2: Problem-solving using Algorithms and Flow charts.				DM5	
3.	Week 3: Exercise Programs on Variable types and type conversions	3	20-02-2024		DM5	
4.	Week 4: Exercise Programs on Operators and the precedence and as associativity.	3	27-02-2024		DM5	
5.	Week 5: Exercise Programs on Branching and logical expressions	3	05-03-2024		DM5	
6.	Week 6: Exercise Programs on Loops, while and for loops	3	12-03-2024		DM5	
7.	Week 7: Exercise Programs on 1 D Arrays & searching.	3	19-03-2024		DM5	
8.	Week 8: Exercise Programs on2 D arrays, sorting and Strings.	3	26-03-2024		DM5	
9.	Week 9: Exercise Programs on Pointers, structures and dynamic memory allocation	3	11-04-2024		DM5	
10.	Week 10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	3	23-04-2024		DM5	
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	3	30-04-2024		DM5	
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	3	07-05-2024		DM5	
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	3	14-05-2024		DM5	
14.	Week 14: Exercise Programs on File handling.	3	21-05-2024		DM5	
15.	Lab Internal	3	28-05-2024			

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

PART-C

EVALUATION PROCESS (R23 Regulations):

Evaluation Task	**Marks**
Day-to-day work	D1=10
Record	R1=05
Internal Test	IT1=15
Continuous Internal Evaluation(CIE)=D1+R1+IT1	**30**
Procedure/Algorithm	P1=20
Experimentation/Program execution	E1=10
Observations/Calculations/Validation	O1=10
Result/Inference	R1=10
Viva voce	V1=20
Semester End Examination (SEE)= P1+ E1+ O1+ V1	**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 1	Organize, Analyze and Interpret the data to extract meaningful conclusions
PSO 2	Design, Implement and Evaluate a computer-based system to meet desired needs.
PSO 3	Develop IT application services with the help of different current engineering tools.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mrs.GeethaRenuka**	**Dr. Y. Vijay Bhaskar Reddy**	**Dr. K. Phaneendra**	**Dr. B. Srinivas Rao**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. R.A.NAIK / Mr. P. Rathnakar Kumar/ Mrs. K.S.L.Lavanya / Mr.Y.Raghu Vamsi

Course Name & Code : ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP & 23EE51

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

Program/Branch/Sem/Sec: B.Tech/AI&ML/II/A **A.Y.:** 2023-24

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

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

CO1	Compute voltage, current and power in an electrical circuit. **(Apply)**
CO2	Compute medium resistance using Wheat stone bridge. **(Apply)**
CO3	Discover critical field resistance and critical speed of DC shunt generators. **(Apply)**
CO4	Estimate reactive power and power factor in electrical loads. **(Understand)**
CO5	Plot the characteristics of semiconductor devices. **(Apply)**
CO6	Demonstrate the working of various logic gates using ICs. **(Understand)**

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
CO1	3	2						2	3	2		1				
CO2	2	2		2				2	2	2						
CO3	2	2	2	2				2	2	2				2		
CO4	2	2		3				2	3	2		1	2			
CO5	3	2			2			2	2	2	1	1	2	2	3	2
CO6	3	3		2	2			2	3	3		1			3	

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

DAY : FRIDAY
Batches : **23761A4201 To 266**

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week
	Tentative date	15/02	22/02	29/02	04/03	22/03	18/04	25/04	02/05	09/05	16/05	30/05
	Actual date											
B-1	**23761A0101 TO 23761A0142**	1	2	3,4	5,6	**INTERNAL EXAM-I**	7	8	9,10	11,12	**REVISION OF EXPERIMENTS**	**INTERNAL EXAM-II**
B-2		1	2	3,4	5,6		7	8	9,10	11,12		
B-3		1	2	3,4	5,6		7	8	9,10	11,12		
B-4		1	2	3,4	5,6		7	8	9,10	11,12		
B-5		1	2	3,4	5,6		7	8	9,10	11,12		
B-6		1	2	3,4	5,6		7	8	9,10	11,12		
B-7		1	2	3,4	5,6		7	8	9,10	11,12		
B-8		1	2	3,4	5,6		7	8	9,10	11,12		
B-9		1	2	3,4	5,6		7	8	9,10	11,12		
B-10		1	2	3,4	5,6		7	8	9,10	11,12		

PART-C

EVALUATION PROCESS (R23 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	R.A.NAIK , P. Rathnakar, K.S.L.Lavanya & Y.Raghu Vamsi	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
Signature				

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DEPARTMENT OF CIVIL ENGINEERING

ENGINEERING MECHANICS & BUILDING PRACTICES LAB (23CE51)
TIMETABLE

Branch: CE — Lab: EM & BP LAB
Course: B. Tech (II Semester) - (R23) — A.Y: 2023-24

DAY	1	2	3	4		5	6	7
	9.00 to 9.50	9.50 to 10.40	10.50 to 11.40	11.40 to 12.30		01.30 to 02.20	02.20 to 03.10	03.10 to 04.00
MON					LUNCH BRACK			
TUE								
WED								
THU								
FRI						---EM & BP LAB---		
SAT								

Lab In-charge **HOD**

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Branch: CE — Lab: EM & BP LAB
Course: B. Tech (II Semester) - (R23) — A.Y: 2023-24

I Cycle Schedule (EM & BP LAB): BATCH-I, II, III & IV

Si. No.	Date	Exp. No.	Experiment
1	16-02-2024	----	Introduction
2	23-02-2024	E1	Study various types of tools used in construction.
3	01-03-2024	E2	Study of Alternative Materials like M-sand, Fly ash, Sea Sand etc.
4	15-03-2024	E3	Field-Visit to understand the Quality Testing - report.
5	22-03-2024	E4	Safety Practices in Construction industry
6	12-04-2024	E5	Demonstration of Non-Destructive Testing - using Rebound Hammer & UPV
7	19-04-2024	E6	Study of Plumbing in buildings.

II Cycle Schedule (EM & BP LAB): BATCH-I, II, III & IV

Si. No.	Date	Exp. No.	Experiment
8	26-04-2024	E7	Experimental Proof of Lami's Theorem
9	03-05-2024	E8	Verification of Law of Parallelogram of Forces.
10	10-05-2024	E9	Determination of Centre of Gravity of different shaped Plane Lamina.
11	17-05-2024	E10	Determination of coefficient of Static and Rolling Friction.
12	24-05-2024	E11	Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever
13	31-05-2024	----	Internal Examination

Lab In-charge **HOD**

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Branch: CE
Course: B. Tech (II Semester) - (R23)

Lab: EM & BP LAB
A.Y: 2023-24

EW LAB BATCHS

BATCHES	ROLL NUMBERS	TOTAL NO
BATCH I	23761A101 to 23761A0108	8
BATCH II	23761A0109 to 23761A0116	8
BATCH III	23761A0117 to 23761A0125	8
BATCH IV	23761A0126 to 23761A0133	8
BATCH V	23761A0134 to 23761A0140	8

Lab In-charge **HOD**

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Branch: CE
Course: B. Tech (II Semester) - (R23)

Lab: EM & BP LAB
A.Y: 2023-24

I CYCLE SCHEDULE

Date/Exp. No	E-I	E-I	E-II	E-IV	E-V	E-VI
23-02-2024	B1	B2	B3	B4	B5	----
01-03-2024	----	B1	B2	B3	B4	B5
15-03-2024	-----	-----	B1	B2	B3	B4
22-03-2024	B4	B5	-----	B1	B2	B3
12-04-2024	B3	B4	B5	-------	B1	B2
19-04-2024	B2	B3	B4	B5	-----	B1

II CYCLE SCHEDULE

Date/Exp. No	E-VII	E-VIII	E-IX	E-X	E-XI
26-04-2024	B1	B2	B3	B4	B5
03-05-2024	B5	B1	B2	B3	B4
10-05-2024	B4	B5	B1	B2	B3
17-05-2024	B3	B4	B5	B1	B2
24-05-2024	B2	B3	B4	B5	B1

Lab In-charge **HOD**

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ENGINEERING MECHANICS & BUILDING PRACTICES LAB (23CE51)

Branch: CE Lab: EM & BP LAB
Course: B. Tech (II Semester) - (R23) A.Y: 2023-24

EXPREMENTS

CYCLE-I

1. To study various types of tools used in construction.
2. Study of Alternative Materials like M-sand, Fly ash, Sea Sand etc.
3. Field-Visit to understand the Quality Testing - report.
4. Safety Practices in Construction industry
5. Demonstration of Non-Destructive Testing - using Rebound Hammer & UPV
6. Study of Plumbing in buildings.

Cycle-II

7. Experimental Proof of Lami's Theorem
8. Verification of Law of Parallelogram of Forces.
9. Determination of Centre of Gravity of different shaped Plane Lamina.
10. Determination of coefficient of Static and Rolling Friction.
11. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever

Lab In-charge **HOD**

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DEPARTMENT OF CIVIL ENGINEERING

Branch: CE | Lab: EM & BP LAB
Course: B. Tech (II Semester) - (R23) | A.Y: 2023-24

PRE-REQUISITES: Engineering Mechanics, Engineering Physics

Course Educational Objectives:

The students completing the course are expected to

1. Understand the layout of a building, concepts of Non-Destructive Testing and different Alternative Materials.
2. Verify the Law of Parallelogram of Forces and Lami's theorem.
3. Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.

Course Outcomes:

After completion of the course students will be able to:

CO1	Illustrate the purpose and working of various tools and materials used in Civil Engineering practice (**Understand**).
CO2	Demonstrate the plumbing and safety practices adopted in construction industry and documentation aspects of quality testing of civil engineering materials (**Understand**).
CO3	Verify the fundamentals involved in the applications of engineering mechanics (**Apply**)

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

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and

	research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Lab In-charge **HOD**