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

COURSE HANDOUT

Part-A

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	05-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	06-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	11-02-2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	12-02-2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	13-02-2026		TLM1	CO1	T1,T2	
10.	TUTORIAL - I	1	14-02-2026		TLM3	CO1	T1,T2	
11.	Non-exact DE Type III	1	17-02-2026		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	18-02-2026		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	19-02-2026		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	20-02-2026		TLM1	CO1	T1,T2	
15.	TUTORIAL - II	1	21-02-2026		TLM3	CO1	T1,T2	
16.	Law of natural growth and decay	1	24-02-2026		TLM1	CO1	T1,T2	
17.	Electrical circuits	1	25-02-2026		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		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	26-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	27-02-2026		TLM1	CO1	T1,T2	
20.	TUTORIAL - III	1	28-02-2026		TLM3	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	04-03-2026		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	05-03-2026		TLM1	CO1	T1,T2	
23.	P.I for polynomial function ,P.I for $e^{ax+b}v(x)$	1	06-03-2026		TLM1	CO1	T1,T2	
24.	TUTORIAL - IV	1	07-03-2026		TLM3	CO1	T1,T2	

25.	P.I for $x^k v(x)$	1	10-03-2026		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	11-03-2026		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	12-03-2026		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	13-03-2026		TLM1	CO1	T1,T2	
29.	TUTORIAL - V	1	14-03-2026		TLM3	CO1	T1,T2	
30.	L-C-R circuits	1	17-03-2026		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	18-03-2026		TLM1	CO1	T1,T2	
32.	Simple Harmonic motion	1	20-03-2026		TLM1	CO1	T1,T2	
33.	Revision	1	31-03-2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	01-04-2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	02-04-2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	04-04-2026		TLM1	CO2	T1,T2	
37.	TUTORIAL - VI	1	07-04-2026		TLM3	CO2	T1,T2	
38.	Solving of PDE	1	08-04-2026		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	09-04-2026		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	10-04-2026		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	11-04-2026		TLM1	CO2	T1,T2	
42.	TUTORIAL - VII	1	15-04-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	Introduction to UNIT IV	1	16-04-2026		TLM1	CO3	T1,T2	
44.	Vector Differentiation	1	17-04-2026		TLM1	CO3	T1,T2	
45.	TUTORIAL - VIII	1	18-04-2026		TLM3	CO3	T1,T2	
46.	Gradient	1	21-04-2026		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	22-04-2026		TLM1	CO3	T1,T2	
48.	Divergence	1	23-04-2026		TLM1	CO3	T1,T2	

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

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	06-05-2026		TLM1	CO4	T1,T2	
58.	Line Integral	1	07-05-2026		TLM1	CO4	T1,T2	
59.	Circulation	1	08-05-2026		TLM1	CO4	T1,T2	
60.	TUTORIAL -XI	1	09-05-2026		TLM3	CO4	T1,T2	
61.	Work done	1	12-05-2026		TLM1	CO4	T1,T2	
62.	Surface Integral	1	13-05-2026		TLM1	CO4	T1,T2	
63.	Flux	1	14-05-2026		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	15-05-2026		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	16-05-2026		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	3	02-06-2026 03-06-2026 04-06-2026		TLM1	CO4	T1,T2	
67.	Divergence Theorem	3	05-06-2026 06-06-2026 09-06-2026		TLM1	CO4	T1,T2	
68.	TUTORIAL - XII	1	10-06-2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		16			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	3	11-06-2026 12-06-2026 13-06-2026		TLM2	CO2	T1,T2	
No. of classes		3			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.

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

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Phone: 08659-222933, **Fax**: 08659-222931
DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradha & Dr.S.L.V.Rajesh Babu
Course Name & Code **:** Engineering Chemistry Lab & 23FE54
L-T-P Structure **:0-0-3** **Credits:1.5**
Program/Sem/Sec : B.Tech./Sem-II/ASE **A.Y. :**2025-26

Pre requisites: Nil

Course Educational Objective:

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

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

CO1: Analyze important parameters of water to check its suitability for drinking purpose and industrial applications. (**Analyze)**
CO2: Acquire practical knowledge related to preparation of Bakelite and nanomaterials. **(Apply)**
CO3: Distinguish different types of titrations in volumetric analysis after performing the experiments listed in the syllabus. **(Understand)**
CO4: To estimate the amount of calcium in cement and the strength of acid present in Pb-Acid battery. (**Apply**)
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): ASE

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	06-02-2026		TLM1		
2.	Preparation of a Bakelite	3	13-02-2026		TLM4	CO1	
3.	Measuring pH of given sample solution using pH meter.	3	20-02-2026		TLM4	CO1	
4.	Determination of amount of HCl using standard Na_2CO_3 solution	3	27-02-2026		TLM4	CO1	
5.	Determination of Strength of an acid in Pb-Acid battery	3	06-03-2026		TLM4	CO1	
6.	Determination of hardness of a groundwater sample.	3	13-03-2026		TLM4	CO1	
7.	Determination of the Alkalinity of a given water sample.	3	20-03-2026		TLM4	CO1	
8.	Estimation of Ferrous Iron by Permanganometry.	3	10-04-2026		TLM4	CO1	
9.	Estimation of Ferrous Iron by Dichrometry.	3	17-04-2026		TLM4	CO2	
10.	Determination of viscosity of lubricating oil by Redwood Viscometer-1 .	3	24-04-2026		TLM4	CO5	
11.	Determination of viscosity of lubricating oil by Redwood Viscometer-2.	3	01-05-2026		TLM4	CO1	
12.	Additional experiment/repeat	3	08-05-2026		TLM4	CO1	
13.	Additional experiment/repeat	3	15-05-2026		TLM4	CO1	
14.	Additional experiment/repeat	3	05-06-2026		TLM4	CO1	
15.	Internal Exam	3	12-06-2026		TLM4	CO1	
	Total						

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

Part - C

EVALUATION PROCESS:

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

(a) Continuous Internal Evaluation(CIE):

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

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

PROGRAMME OUTCOMES (POs):

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

	for sustainable development.
PO 8	**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	**Mr.S.Vijaya Dasaradha**	**Dr.V.Parvathi**	**Dr.V.Parvathi**	**Dr.T.Satyanarayana**
Signature				

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DEPARTMENT OF AEROSPACE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: **Dr. B. SRINIVASA RAO**	
Course Name & Code	: **INTRODUCTION TO PROGRAMMING &**	**23CS01**
L-T-P Structure	: **3-0-0**	Credits: **3**
Program/Sem/Sec	: **B.TECH.(ASE)/II SEMESTER/A SECTION**	A.Y. : **2025-26**

PRE-REQUISITE : MATHEMATICS

COURSE EDUCATIONAL OBJECTIVE (CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT – I: Introduction to Programming and Problem Solving

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Discussion of CEO's and CO's	1	03-02-2026		TLM2	
2.	Introduction to Programming	1	04-02-2026		TLM2	
3.	COs & CO-PO Mapping History of Computers	2	05-02-2026 07-02-2026		TLM2 TLM2	
4.	Basic organization of a computer: ALU, input-output units, Memory, program counter	1	10-02-2026		TLM2	
5.	Introduction to Programming Languages,	1	11-02-2026		TLM2	
6.	Basics of a Computer Program- Algorithms	1	12-02-2026		TLM2	
7.	Flowcharts (Using Dia-Tool), pseudo code.	1	14-02-2026		TLM2	
8.	Introduction to Compilation and Execution	1	17-02-2026		TLM2	
9.	Primitive Data Types	1	18-02-2026		TLM2	
10.	Variables, and Constants, Basic Input and Output operations	1	19-02-2026		TLM2	
11.	Type Conversion, and Casting	1	21-02-2026		TLM2	
12.	**Problem solving techniques:** Algorithmic approach, characteristics of algorithm	1	24-02-2026		TLM2	
13.	Problem solving strategies: Top-down approach, Bottom-up approach	1	25-02-2026		TLM2	
14.	Time and space complexities of algorithms.	1	26-02-2026		TLM2	
No. of classes required to complete UNIT – I: 15				**No. of classes taken:**		

UNIT – II: Control Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Simple sequential programs Conditional Statements	1	28-02-2026		TLM2	
16.	if, if-else	1	04-03-2026		TLM2	
17.	Else-if ladder, nested if	1	05-03-2026		TLM2	
18.	Switch, sample programs	1	07-03-2026		TLM2	
19.	Example programs on Decision Making and Branching	1	10-03-2026		TLM2	
20.	Loops: while , Example programs	1	11-03-2026		TLM2	
21.	Loops: do-while, Example programs	1	12-03-2026		TLM2	
22.	Loops: for, Example programs	1	14-03-2026		TLM2	
23.	Break , Example programs	1	17-03-2026		TLM2	
24.	Continue, Goto Example programs	1	18-03-2026		TLM2	
No. of classes required to complete UNIT – II: 10				**No. of classes taken:**		

UNIT – III: Arrays and Strings

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
25.	Arrays Introduction, Declaration	1	31-03-2026		TLM2	
26.	Array indexing, Accessing elements	1	01-04-2026		TLM2	
27.	Memory model	1	02-04-2026		TLM2	
28.	Programs with array of integers	1	04--04-2026		TLM2	
29.	Introduction to two dimensional arrays	1	07-04-2026		TLM2	
30.	2D Array indexing, Accessing elements	1	08-04-2026		TLM2	
31.	Programs with 2D arrays	1	09-04-2026		TLM2	
32.	Introduction to Strings	1	11-04-2026		TLM2	
33.	Strings: Reading & Writing Operations	1	15-04-2026		TLM2	
34.	String Handling Functions	2	16-04-2026 18-04-2026		TLM2	
No. of classes required to complete UNIT – III: 11				**No. of classes taken:**		

UNIT – IV: Pointers & User Defined Data types

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction to Pointers	1	21-04-2026		TLM2	
36.	Dereferencing and address operators	1	22-04-2026		TLM2	
37.	Pointer and address arithmetic	1	23-04-2026		TLM2	
38. 39.	Array manipulation using pointers	2	25-04-2026 28-04-2026		TLM2	
40.	User-defined data types	1	29-04-2026		TLM2	
41. 42.	Structures, Definition and Initialization	2	30-04-2026 02-05-2026		TLM2 TLM2	
43.	Example programs	1	05-05-2026		TLM2	
44.	Unions	1	06-05-2026		TLM2	
45.	Example programs	1	07-05-2026		TLM2	
46.	Revision	1	09-05-2026		TLM2	
No. of classes required to complete UNIT – IV: 11				**No. of classes taken:**		

UNIT – V: Functions and File Handling

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
47.	Introduction to Functions	1	12-05-2026		TLM2	
48.	Function Declaration and Definition	1	13-05-2026		TLM2	
49.	Function call Return Types	1	14-05-2026		TLM2	
50.	Arguments	1	16-05-2026		TLM2	
51. 52.	Modifying parameters inside functions using pointers	1	02-06-2026		TLM2	
53.	Arrays as parameters	1	03-06-2026		TLM2	
54.	Scope and Lifetime of Variables	1	04-06-2026		TLM2	
55.	Storage classes examples	1	06-06-2026		TLM2	
56.	Introduction to Files	1	09-06-2026		TLM2	
57.	Basics of File Handling	1	10-06-2026		TLM2	
58.	Operations on Files	1	11-06-2026		TLM2	
No. of classes required to complete UNIT – V: 11				**No. of classes taken:**		

Content Beyond the Syllabus:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
59.	Real time problems on Control structures, Arrays, Patterns & Strings	1	13-06-2026		TLM2	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs) - AEROSPACE ENGINEERING:

PSO1	To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures and Flight Dynamics in the Aerospace vehicle design.
PSO2	To prepare the students to work effectively in Aerospace and Allied Engineering organizations.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. B. SRINIVASA RAO	Dr. B. SRINIVASA RAO	Dr. K. PHANEENDRA	Dr. D. RATNA KISHORE
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
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DIVISION OF CHEMISTRY
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.S.Vijaya Dasaradjha
Course Name & Code :Engineering Chemistry& 23FE06
L-T-P Structure :3-0-0 **Credits:03**
Program/Sem/Sec : B.Tech./Sem-II/ASE **A.Y. :**2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs): At the end of the course, student will be able to
CO1: 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 handout (Lesson plan): ASE

UNIT-I: Water Technology

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to CO's, PO's of EC	1	04-02-2026		TLM1	
2.	Soft and hard water, Estimation of hardness of water by EDTA Method	2	05-02-2026 & 06-02-2026		TLM1	
3.	Estimation of dissolved Oxygen	1	07-02-2026		TLM1	
4.	Boiler troubles – Priming, foaming	1	11-02-2026		TLM1	
5.	Scale and sludge, Caustic embrittlement	2	12-02-2026 & 13-02-2026		TLM1	
6.	Industrial water treatment	1	14-02-2026		TLM1	
7.	Specifications for drinking water, Bureau of Indian Standards (BIS) and World health organization (WHO) standards	2	18-02-2026 & 19-02-2026		TLM1	
8.	Ion-exchange processes - desalination of brackish water	1	20-02-2026		TLM1	
9.	reverse osmosis (RO) and electrodialysis	1	21-02-2026		TLM1	
10.	Revision and assignment	1	25-02-2026		TLM1	
No. of classes required to complete UNIT-I: 13				No. of classes taken:		

UNIT-II: 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	26-02-2026		TLM1	
2.	Cell potential calculations and numerical problems	1	27-02-2026		TLM1	
3.	Primary cells – Zinc-air battery, Secondary cells –	1	28-02-2026		TLM1	

	Nickel-Cadmium (NiCad)					
4.	Lithium ion batteries-principle and cell reactions	1	04-03-2026		TLM1	
5.	Fuel cells-Basic Concepts, principle and working of hydrogen-oxygen Fuel cell.	1	05-03-2026		TLM1	
6.	Corrosion-Introduction, Classification, corrosion, electrochemical theory of corrosion	1	06-03-2026		TLM1	
7.	Metal oxide formation by dry electrochemical corrosion, Pilling Bed-worth ratios and uses	2	07-03-2026 & 11-03-2026		TLM2	
8.	Differential aeration cell corrosion, galvanic corrosion	1	12-03-2026		TLM2	
9.	Factors affecting the corrosion, cathodic and anodic protection	2	13-03-2026 & 14-03-2026		TLM2	
10.	electroplating and electro less plating (Nickel and Copper)	1	18-03-2026		TLM2	
11.	Revision and assignment	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 13				No. of classes taken:		

UNIT-III: POLYMERS AND FUEL 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	01-04-2026		TLM1	
2.	Mechanism of chain growth and step growth polymerization	1	02-04-2026		TLM1	
3.	Plastics –Thermo and Thermosetting plastics-Preparation, properties and applications of – Polystyrene, PVC, Teflon	1	04-04-2026		TLM1	
4.	Preparation, properties and applications of – Bakelite, Nylon-6,6,	1	08-04-2026		TLM1	
5.	Elastomers–Buna-S, Buna-N, Thiokol rubbers–preparation, properties and applications	1	09-04-2026		TLM1	
6.	Fuels – Types of fuels, calorific value of fuels, numerical problems based on calorific value;	1	10-04-2026		TLM1	

7.	Analysis of coal (Proximate and Ultimate analysis)	2	11-04-2026 & 15-04-2026		TLM1	
8.	Liquid Fuels, refining of petroleum, Octane and Cetane number	2	16-04-2026 & 17-04-2026		TLM1	
9.	Alternative fuels- propane, methanol, ethanol and bio fuel-bio diesel.	1	18-04-2026			
10.	Revision and assignment	1	22-04-2026		TLM1	
No. of classes required to complete UNIT-IV: 12				No. of classes taken:		

UNIT-IV: 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.	Composites- Definition, Constituents, Classification- Particle, Fibre and Structural reinforced composites	2	23-04-2026 & 24-042026		TLM1	
2.	Properties and Engineering applications of composites	1	25-04-2026		TLM1	
3.	Refractories- Classification, Properties, Factors affecting the refractory materials and Applications	2	29-04-2026 & 30-04-2026		TLM1	
4.	Lubricants- Classification, Functions of lubricants, Mechanism, Properties of lubricating oils – Viscosity, Viscosity Index	2	01-05-2026 & 02-05-2026		TLM1	
5.	Flash point, Fire point, Cloud point, saponification and Applications	1	06-05-2026		TLM1	
6.	Building materials- Portland Cement, constituents.	1	07-05-2026		TLM1	
7.	Setting and Hardening of cement.	1	08-05-2026		TLM1	
8.	Revision and assignment	1	09-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 11				No. of classes taken:		

UNIT-V: Surface Chemistry and Nanomaterial

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	13-05-2026		TLM1	
2.	Nanometals and nanometal oxides, micelle formation, synthesis of colloids (Braggs Method)	2	14-05-2026 & 15-05-2026		TLM1	
3.	Chemical and biological methods of preparation of nanometals and metal oxides	2	16-05-2026 & 03-06-2026		TLM1	
4.	Stabilization of colloids and nanomaterials by stabilizing agents, adsorption isotherm (Freundlich and Longmuir)	2	04-06-2026 & 05-06-2026		TLM1	
5.	BET equation (no derivation) applications of colloids and nanomaterials – catalysis, medicine, sensors,	2	06-06-2026 & 10-06-2026		TLM1	
9.	Revision and assignment	1	11-06-2025		TLM1	
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

TOPICS BEYOND THE SYLLABUS

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

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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DEPARTMENT OF AEROSPACE ENGINEERING

PART-A

Name of Course Instructor : **Mrs. Rehana Begum**

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

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

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

PRE-REQUISITE: Fundamentals of Mathematics.

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

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

CO1:	Read, understand, and trace the execution of programs written in C language.	**Apply–Level2**
CO2:	Apply the right control structures for solving the problem	**Apply–Level3**
CO3:	Develop, Debug and Execute programs to demonstrate the applications of arrays, functions, pointers and files in C.	**Apply–Level3**
CO4:	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	-	-	-	-	-	-	-	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	**6**	02-02-2026 09-02-2026		**DM5**	
2.	Week 2: Problem-solving using Algorithms and Flow charts.	**3**	16-02-2026		**DM5**	
3.	Week 3: Exercise Programs on Variable types and type conversions	**3**	23-02-2026		**DM5**	
4.	Week 4: Exercise Programs on Operators and the precedence and as associativity.	**3**	02-03-2026		**DM5**	
5.	Week 5: Exercise Programs on Branching and logical expressions	**3**	09-03-2026		**DM5**	
6.	Week 6: Exercise Programs on Loops, while and for loops	**3**	16-03-2026		**DM5**	
7.	Week 7: Exercise Programs on 1 D Arrays & searching.	**3**	23-03-2026		**DM5**	
8.	Week 8: Exercise Programs on2 D arrays, sorting and Strings.	**3**	30-03-2026		**DM5**	
9.	Week 9: Exercise Programs on Pointers, structures and dynamic memory allocation	**3**	06-04-2026		**DM5**	
10.	Week 10: Exercise Programs on Bit fields, Self-Referential Structures, Linked lists	**6**	13-04-2026 20-04-2026		**DM5**	
11.	Week 11: Exercise Programs on Functions, call by value, scope and extent.	**3**	27-04-2026		**DM5**	
12.	Week 12: Exercise Programs on Recursion, the structure of recursive calls	**3**	04-05-2026		**DM5**	
13.	Week 13: Exercise Programs on Call by reference, dangling pointers	**3**	11-05-2026		**DM5**	
14.	Week 14: Exercise Programs on File handling.	**3**	01-06-2026		**DM5**	
15.	Lab Internal	**3**	08-06-2026			

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):

PSO1	To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures and Flight Dynamics in the Aerospace vehicle design.
PSO2	To prepare the students to work effectively in Aerospace and Allied Engineering organizations.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mrs. Rehana Begum**	**Dr. B. Srinivasa Rao**	**Dr. K. Phaneendra**	**Dr. D. Ratna Kishore**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
L.B.Reddy Nagar, Mylavaram – 521 230, N.T.R. District, Andhra Pradesh, India
Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi
Accredited by NBA under Tier - I, Accredited by NAAC
An ISO 21001:2018, 50001:2018, 14001:2015 Certified Institution
DEPARTMENT OF AEROSPACE ENGINEERING
Estd.: 1998 Website: https://www.lbrce.ac.in/ase/index.php Email: hodaero@lbrce.ac.in Phone:08659-222933 Ext:624/623

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. B. UDAYA LAKSHMI
Course Name & Code : Engineering Mechanics & 20ME02
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Sem : B. Tech / II-Sem **A.Y.:** 2025-26

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	2-2-26		TLM2	
2.	Course Outcomes, CEOs, POs, PEOs	1	5-2-26		TLM2	
3.	Basic terminology in Mechanics, laws of Mechanics	1	6-2-26		TLM,2	
4.	Force, Characteristics of Forces, Force Systems	1	7-2-26		TLM 1,2	
5.	Resolution and Composition of forces, Parallelogram, Triangle and Polygon Law of Forces	1	9-2-26		TLM1,2	
6.	Resultant of Coplanar Concurrent Force System-Problems	1	12-2-26		TLM1,2	
7.	Moment of a Force, Couple – Varignon's Theorem	1	13-2-26		TLM2	
8.	**Tutorial-1**	1	14-2-26		TLM3	
9.	Resultant of Coplanar Non-Concurrent Force System-Problems	1	16-2-26		TLM1,2	
10.	**EQUILIBRIUM OF SYSTEM OF FORCES**: Equilibrium equations of concurrent and non concurrent force system, Free Body Diagrams, Lami's Theorem	1	19-2-26		TLM1,2	
11.	Equilibrium of a rigid body subjected to coplanar concurrent forces	1	20-2-26		TLM2	
12.	Equilibrium of a rigid body subjected to non-concurrent forces- Problems.	1	21-2-26		TLM2	
13.	**Tutorial-2**	1	23-2-26		TLM3	
14.	Problems related to Connected Bodies, Roller problems	1	26-2-26		TLM1,2	
15.	Roller problems, Assignment -1/ Quiz-1	1	27-2-26		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	28-2-26		TLM1, 2	
17.	Types of Friction, limiting friction, Laws of Friction	1	2-3-26		TLM1,2	
18.	Co-efficient of Friction, Angle of Friction – Angle of Repose	1	5-3-26		TLM1,2	
19.	Blocks resting on horizontal plane	1	6-3-26		TLM1,2	
20.	Problems on Blocks resting on horizontal plane	1	7-3-26		TLM1	
21.	One Block resting on another block, Blocks resting on Inclined plane	1	9-3-26		TLM1,2	

22.	Problems--Blocks resting on Inclined plane	1	12-3-26		TLM2	
23.	Problems--Blocks resting on Inclined plane	1	13-3-26		TLM2	
24.	**Tutorial-3**	1	14-3-26		TLM3	
25.	Problems--Blocks resting on Inclined plane Assignment -II/ Quiz-I1	1	16-3-26		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	20-3-26		TLM2	
27.	Centroid of simple figures from basic principles	1	30-3-26		TLM1,2	
28.	Centroid of simple composite sections	1	2-4-26		TLM2	
29.	**AREA MOMENT OF INERTIA:** Moment of inertia, Theorems of Moment of Inertia	1	3-4-26		TLM2	
30.	Determination of Moment of Inertia of Rectangle, Circle, Hollow Circle	1	4-4-26		TLM2	
31.	Determination of Moment of Inertia of Semi Circle, Triangle from basic principles	1	6-4-26		TLM2	
32.	Problems on moment of inertia	1	9-4-26		TLM1	
33.	**Tutorial – 4** - Area Moment of Inertia-problems	1	10-4-26		TLM3	
34.	Problems on Area moment of inertia	1	11-4-26		TLM1	
35.	Unit-III Revision (Centroid & Area Moment of Inertia)	1	13-4-26		TLM1	
36.	**CENTRE OF GRAVITY**: Centre of gravity of solid cylinder	1	16-4-26		TLM2	
37.	Centre of gravity of right circular cone, hemi sphere	1	17-4-26		TLM1,2	
38.	Centre of gravity of composite bodies	1	18-4-26		TLM1,2	
39.	**MASS MOMENT OF INERTIA:** Introduction, Radius of gyration	1	20-4-26		TLM2	
40.	Determination of Mass Moment of Inertia of Uniform Rod, Rectangular Plate, Circular Plate-problems	1	23-4-26		TLM1,2	
41.	**Tutorial-5 &** Assignment -III/ Quiz-III	1	24-4-26		TLM3	
42.	Determination of Mass Moment of Inertia of Solid Sphere, Solid Cylinder--problems	1	25-4-26		TLM1	
43.	Unit-III Revision	1	27-4-26		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, general principles in dynamics, types of motion, rectilinear motion	1	30-4-26		TLM1,2	
45.	Motion with Uniform Velocity - Problems	1	1-5-26		TLM1,2	
46.	Motion with Uniform Acceleration derivations- problems	1	2-5-26		TLM1,2	
47.	**Tutorial-6**	1	4-5-26		TLM1,2	
48.	Motion with Uniform Acceleration- Problems	1	7-5-26		TLM3	
49.	Motion with varying acceleration - Problems	1	8-5-26		TLM2	
50.	D-Alembert's principle –	1	9-5-26		TLM2	
51.	Work Energy method and applications to particle Impulse momentum method	1	11-5-26		TLM1,2	
52.	**Tutorial-7 &** Assignment -III/ Quiz-III	1	14-5-26		TLM3	
53.	Uniformly accelerated rotation-problems	1	15-5-26		TLM1,2	
54.	Unit-IV Revision	1	16-5-26		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	1-6-26		TLM1,2	
56.	Kinetics of rigid bodies Rotating about Fixed Axis, Derivations	1	4-6-26		TLM1,2	
57.	**Tutorial-8**	1	5-6-26		TLM3	
58.	Work Energy method	1	5-6-26		TLM1,2	
59.	Impulse momentum method	1	6-6-26		TLM2	
60.	Simple Applications	1	8-6-26		TLM1,2	
61.	**Tutorial-9**	1	11-6-26		TLM1,3	
62.	Fixed rotation of bodies, Assignment -V/ Quiz-V	1	11-6-26		TLM3	
63.	Unit-V Revision	1	12-6-26		TLM1,2	
64.	Unit-III, IV, V Revision	1	13-6-26		TLM2,3	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

SYLLABUS BEYOND 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.	Calculation of Support reactions	1			TLM1,2	
2.	Force Analysis of Trusses	1			TLM1,2	
No. of classes required to complete : 02				**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	**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	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.

Title	**Course Instructor**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	B.Udaya Lakshmi	S. Indrasena Reddy	Dr. P. Lova Raju
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(Autonomous)
Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
Accredited by NAAC with Grade 'A' & ISO: 21001:2018, 50001:2018, 14001:2015 certified
Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.A.V.G.A MARTHANDA
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Branch/Sem/Sec: B.Tech/ASE, A Sec II SEM **A.Y.:** 2025-26

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)**

CO-PO Articulation Matrix:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO 1	2	2	2	_	_	_	_	_	_	_	_	1
CO 2	2	2	_	_	_	_	_	_	_	_	_	_
CO 3	2	2	_	_	_	3	_	_	_	_	2	2
CO 4	2	2	_	_	_	_	_	_	_	_	_	1
CO 5	3	2	_	_	_	_	_	_	_	_	_	1
CO 6	2	2	2	_	_	_	_	_	_	_	_	_
Where: 1: Slight (Low) 2: Moderate (Medium) 3: Substantial (High)												

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

Reference Books:

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):

ELECTRICAL ENGINEERING

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.	**DC Circuits:** Introduction:PEOs,PO&PSOs,COs	1	02-02-2026			
2.	Electrical circuit elements	1	03-02-2026		TLM1	
3.	KCL & KVL,Ohm's Law and its limitations	1	06-02-2026		TLM1	
4.	series, parallel, series-parallel circuits	1	07-02-2026		TLM1	
5.	Super Position theorem	1	9-02-2026		TLM1	
6.	**AC Circuits:** Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	10-02-2026		TLM1	
7.	average value, RMS value, form factor, peak factor	1	13-02-2026		TLM2	
8.	Impedance, Power ,RLC Circuits	1	14-02-2026		TLM1	
9.	Simple numerical problems	1	16-02-2026			
No. of classes required to complete UNIT-I: 09				**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
10.	**Machines:** Construction, principle and operation of (i) DC Motor	1	17-02-2026		TLM2	
11.	Construction, principle and operation of (ii) DC Generator.	1	20-02-2026		TLM2	
12.	Single Phase Transformer	1	21-02-2026		TLM2	
13.	Three Phase Induction Motor	1	23-02-2026		TLM2	
14.	Alternators, Applications of electrical machines	1	24-02-2026		TLM2	
15.	**Measuring Instruments:** Construction and working	1	27-02-2026		TLM2	

	principle of Permanent Magnet Moving Coil (PMMC)					
16.	Moving Iron (MI) Instruments & Wheatstone bridge	1	28-02-2026		TLM2	
No. of classes required to complete UNIT-II: 07				**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
17.	Conventional and non-conventional energy resources, Hydel & Nuclear power generation	1	02-03-2026		TLM2	
18.	Solar & Wind power plants	1	6-03-2026		TLM2	
19.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc	1	7-03-2026		TLM2	
20.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.	1	9-03-2026		TLM2	
21.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	10-03-2026		TLM2	
22.	Personal safety measures: Electric Shock, Earthing and its types& Safety Precautions	1	13-03-2026		TLM2	
23.	**Beyond the Syllabus**: Thermal Power Plant	1	14-03-2026			
No. of classes required to complete UNIT-III: 7				**No. of classes taken:**		

I Mid Examinations: 23-03-2026 to 28- 03-2026

ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction – Course Outcomes	1	30-03-2026		TLM1	
2.	Evolution of electronics, Vacuum tubes to nano electronics	1	31-03-2026		TLM1	
3.	Characteristics of PN Junction Diode	1	02-04-2026		TLM1	
4.	Zener Effect — Zener Diode and its Characteristics	1	06-04-2026		TLM1	
5.	Zener Effect — Zener Diode and its Characteristics	1	07-04-2026		TLM1	
6.	Bipolar Junction Transistor	1	10-04-2026		TLM1	
7	CB Configurations and Characteristics	1	13-04-2026		TLM2	
8.	CE,CC Configurations and Characteristics.	1	17-04-2026		TLM2	
9	Elementary Treatment of Small Signal CE Amplifier.	1	18-04-2026		TLM1	
No. of classes required to complete UNIT-I: 9				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	20-04-2026		TLM1	
11	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	21-04-2026		TLM1	
12	Working of simple Zener voltage regulator.	1	24-04-2026		TLM1	
13	**Amplifiers**: Block diagram of Public Address system	1	25-04-2026		TLM2	
14	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	27-04-2026		TLM2	
15	**Electronic Instrumentation:** Block diagram of an electronic instrumentation system.	1	28-04-2026		TLM2	
No. of classes required to complete UNIT-II: 06				**No. of classes taken:**		

UNIT-III: Digital Electronics

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16	Overview of Number Systems	1	01-05-2026		TLM1	
17	Logic gates including Universal Gates	1	02-05-2026		TLM2	

18	BCD codes, Excess-3 code	1	04-05-2026		TLM!	
19	Gray code, Hamming code	1	05-05-2026		TLM!	
20	Boolean Algebra basics	1	08-05-2026		TLM1	
21	Basic Theorems and properties of Boolean Algebra	1	9-05-2026		TLM2	
22	Simple combinational circuits	1	11-05-2026		TLM1	
23	Half and Full Adders	1	12-05-2026		TLM1	
24	Introduction to sequential circuits, Flip flops,	1	15-05-2026		TLM2	
25	Registers and counters	1	01-06-2026		TLM2	
26	Review	1	02-06-2026		TLM1	
27	**Beyond the syllabus:** Operational Amplifier	1	05-06-2026		TLM1	

No. of classes required to complete UNIT-III: 12	**No. of classes taken:**

II Mid Examinations: 15-06-2026 to 20- 06-2026

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

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

Commencement of Class Work	02-02-2026		
I Phase of Instructions	02-02-2026	21-03-2026	7 W
I MID Examinations	**23-03-2026**	**28-03-2026**	**1 W**
II Phase of Instructions	30-03-2026	16-05-2026	7 W
Summer Vacation	18-05-2026	30-05-2026	2 W
II Phase of Instructions	01-06-2026	13-06-2026	2 W
II MID Examinations	**15-06-2026**	**20-06-2026**	**1 W**
Preparation & Practicals	22-06-2026	27-06-2026	1 W
Semester End Examinations	**29-06-2026**	**11-07-2026**	**2 W**

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.

Date: 30-01-2026

Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Mr.R.Anjaneyulu Naik	Dr. AVGA Marthanda	Dr. G.Nageswara Rao	Dr. P.Sobharani

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.A.V.G.A.Marthanda Dr.B. Pangidaiah Dr.G.Nageswara Rao, , Mr.P.Ratnakar Kumar
Course Name & Code : ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP & 23EE51
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/ASE , II SEM
A.Y.: 2025-26

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)**

COURSE ARTICULATION MATRIX (Correlation between COs & POs):

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12
CO1	3	2						2	3	2		1
CO2	2	2		2				2	2	2		
CO3	2	2	2	2				2	2	2		
CO4	2	2		3				2	3	2		1
CO5	3	2			2			2	2	2	1	1
CO6	3	3		2	2			2	3	3		1
1 - Low					**2 –Medium**			**3 - High**				

PART-B

ELECTRICAL ENGINEERING

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to BEEE Lab , Importance of Electrical Lab, its Objectives and Outcomes, BASIC MEASURING METERS, SAFETY PRECAUATIONS & Other suggestions.	3	02-02-2026		TLM4	
2.	Verification of KCL and KVL	3	09-02-2026		TLM4	
3.	Verification of Superposition theorem	3	16-02-2026		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	23-02-2026		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	02-03-2026		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	09-03-2026		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	16-03-2026		TLM4	
8.	Revision	3	30-03-2026		TLM4	
9.	Internal Lab Examination (**Electrical**)	3	06-04-2026			

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

TLM3	Tutorial	**TLM6**	Group Discussion/Project

ELECTRONICS ENGINEERING

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to BEEE Lab (Function Generators, CRO, RPS, Breadboard etc), Course Objectives and Outcomes.	3	13-04-2026		TLM4	
2.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	20-04-2026		TLM4	
3.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator	3	27-04-2026		TLM4	
4.	Implementation of half wave and full wave rectifiers	3	04-05-2026		TLM4	
5.	Plot Input & Output characteristics of BJT in CB configuration	3	11-05-2026		TLM4	
6.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	18-05-2026		TLM4	
7.	Verification of Truth Tables of S-R, J- K& D flip flops using respective ICs	3	25-05-2026		TLM4	
8.	Revision	3	01-06-2026		TLM4	
9	Internal Lab Examination (**Electronics**)	3	08-06-2026		TLM4	

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work	1,2,3,4,5,6,7,8…	A1 =10
Record and observation	1,2,3,4,5,6,7,8…	B1 = 5
Internal Exam	1,2,3,4,5,6,7,8…	**C1=15**
Cumulative Internal Examination (CIE):(A1+B1+C1)	1,2,3,4,5,6,7,8…	**30**
Semester End Examination (SEE)	1,2,3,4,5,6,7,8…	**70**
Total Marks=CIE+SEE		**100**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 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
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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.

Date: 30-01-2026

Course Instructor **Course Coordinator** **Module Coordinator** **Head of the Department**

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DEPARTMENT OF AEROSPACE ENGINEERING
Estd.: 1998 Website: https://www.lbrce.ac.in/ase/index.php Email: hodaero@lbrce.ac.in Phone:08659-222933 Ext:624/623

COURSE HANDOUT

PART-A

Name of Course Instructor(s): Mrs B.UDAYA LAKSHMI/ Mr A.Pratyush

Course Name & Code	**:** Engineering Mechanics Lab & 23ME52	**Regulation**	: R23
L-T-P Structure	**: 0-0-3 – 1 ½**	**Credits**	**:** 01 ½
Program/Sem/Sec	: B.Tech – II Semester – A Section	**A.Y.**	**:** 2025-26
Continuous Internal Assessment	**: 30**	**Semester End Examination**	**: 70**

PREREQUISITE: Engineering Mechanics, Engineering Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The students completing the course are expected to:

- Verify the Law of Parallelogram and Triangle of Forces.
- Determine the coefficients of friction of Static and Rolling friction and Centre of gravity of different plane Lamina.
- Analyze the system of Pulleys and Moment of Inertia of Compound Pendulum and Flywheel.

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

CO1	Evaluate the coefficient of friction between two different surfaces and between the inclined plane and the roller. (**Applying - L3**)
CO2	Verify the Law of Polygon of Forces and Law of Moment using force polygon and bell crank lever. **(Applying - L3)**
CO3	Determine the Centre of gravity and Moment of Inertia of different configurations. **(Applying - L3)**
CO4	Apply the equilibrium conditions of a rigid body under the action of different force systems. **(Applying - 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						2	1	3	3
CO2	3				3	2						2		2	2
CO3	3				3							2			
CO4	3				3							2		2	2
1 - Low					**2** –Medium							**3** - High			

REFERENCES

References:

1. S. Timoshenko, D. H. Young, J.V. Rao, S. Pati., Engineering Mechanics, 5th Edition, McGraw Hill Education.
2. Hibbeler R.C., Engineering Mechanics: Statics and Dynamics, 14th Edition, Pearson Education, Inc., New Delhi, 2022
3. Engineering Mechanics Lab Manual

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): (B. Tech – II Semester - Section – A) (R 23)

Schedule of the lab: Every Monday (from 09.50 AM – 12.30 PM)

Batch size:

S.No	Batches	Regd. Nos	Total No. of Students
01	Section A	24761A5617,25761A0301 – 333, 334 – 366	66

Division of Batches:

Batch No	Regd. No of students	Batch size
A1	24761A5617 25761A0301 – 305	06
A2	25761A0306 – 312	06
A3	25761A0313 – 320	07
A4	25761A0321 – 327	07
A5	25761A0328 – 333	07

Batch No	Regd. No of students	Batch size
A6	25761A0334 – 339	06
A7	25761A0340 – 346	06
A8	25761A0347 – 352	07
A9	25761A0353 – 359	07
A10	25761A0360 – 366	07

List of Experiments:

1. Verification of Law of Parallelogram of Forces. (Ex 1)
2. Verification of Law of Triangle of Forces. (Ex 2)
3. Verification of the Law of polygon for coplanar-concurrent forces acting on a particle in equilibrium and to find the value of unknown forces considering particle to be in equilibrium using universal force table. (Ex 3)
4. Determination of coefficient of Static and Rolling Frictions (Ex 4)
5. Determination of Centre of Gravity of different shaped Plane Lamina. (Ex 5)
6. Verification of the conditions of equilibrium of a rigid body under the action of coplanar non-concurrent, parallel force system with the help of a simply supported beam. (Ex 6)
7. Study of the systems of pulleys and draw the free body diagram of the system. (Ex 7)
8. Determine the acceleration due to gravity using a compound pendulum. (Ex 8)
9. Determine the Moment of Inertia of the compound pendulum about an axis perpendicular to the plane of oscillation and passing through its centre of mass. (Ex 9)
10. Determine the Moment of Inertia of a Flywheel. (Ex 10)
11. Verification of Law of Moment using Rotation Disc Apparatus and Bell Crank Lever. (Ex 11)
12. Verification of Work Energy and Impulse Momentum methods. (Ex 12)

Division of Cycles:

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
01	Introduction to Engineering Mechanics Lab, Demonstration of all experiments, CEOs, and COs of the Laboratory	3	**4-2-26**		TLM4	
Cycle-I (Each batch will perform the experiments according to the academic calendar and the schedule) The batch A1 schedule is shown as an example here						
02	Verification of Law of Parallelogram of Forces	3	**11-2-26**		TLM4	
03	Verification of Law of Triangle of Forces	3	**18-2-26**		TLM4	
04	Verification of the Law of polygon for coplanar-concurrent forces acting on a particle in equilibrium and to find the value of unknown forces considering particle to be in equilibrium using universal force table	3	**25-2-26**		TLM4	
05	Determination of coefficient of Static and Rolling Frictions	3	**4-3-26**		TLM4	
06	Determination of Centre of Gravity of different shaped Plane Lamina	3	**11-3-26**		TLM4	
07	Verification of the conditions of equilibrium of a rigid body under the action of coplanar non-concurrent, parallel force system with the help of a simply supported beam	3	**18-3-26**		TLM4	
I Mid Exams: 23-3-2026 TO 28-3-2025						
Cycle II (Each batch will perform the experiments according to the academic calendar and the schedule) The batch A1 schedule is shown as an example here						
08	Study of the systems of pulleys and draw the free-body diagram of the system	3	**1-4-26**		TLM4	
09	Determine the acceleration due to gravity using a compound pendulum	3	**8-4-26**		TLM4	
10	Determine the Moment of Inertia of the compound pendulum about an axis perpendicular to the plane of oscillation and passing through its centre of mass	3	**15-4-26**		TLM4	
11	Determine the Moment of Inertia of a Flywheel	3	**22-4-26**		TLM4	
12	Verification of the Law of Moment using Rotation Disc Apparatus and Bell Crank Lever	3	**29-4-26**		TLM4	
13	Verification of Work Energy and Impulse Momentum methods	3	**6-5-26**		TLM4	
14	REPITION LAB	3	**13-5-26**			
15	Internal Exam and Viva - Voce	3	**3-6-26**		TLM4	
II Mid Exams: 02-06-2025 to 7-06-2025						

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

ACADEMIC CALENDAR

Commencement of II Semester Classwork	**13-01-2025**		
Description	**From**	**To**	**Weeks**
I Phase of Instructions	2-2-26	21-3-26	8 Weeks
I Mid Examinations	23-3-26	28-3-26	1 Week
II Phase of Instructions	30-3-26	16-5-26	8 Weeks
II Mid Examinations	15-6-26	20-6-26	1 Week
Preparation and Practicals	22-6-26	27-6-26	1 Week
Semester End Examinations	29-6-26	11-7-26	1 Week
Commencement of III Semester Classwork	**30-6-2023**		

Schedule of Experiments:

Date	A1	A2	A3	A4	A5	A6	A7	A8	A9	A10
4-2-26	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10
11-2-26	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10	Ex 1
18-2-26	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10	Ex 1	Ex 2
25-2-26	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10	Ex 1	Ex 2	Ex 3
4-3-26	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10	Ex 1	Ex 2	Ex 3	Ex 4
11-3-26	Ex 6	Ex 7	Ex 8	Ex 9	Ex 10	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5
18-3-26	Ex 7	Ex 8	Ex 9	Ex 10	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6
1-4-26	Ex 8	Ex 9	Ex 10	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7
8-4-26	Ex 9	Ex 10	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8
15-4-26	Ex 10	Ex 1	Ex 2	Ex 3	Ex 4	Ex 5	Ex 6	Ex 7	Ex 8	Ex 9
22-4-26	Ex 11	Ex 11	Ex 11	Ex 11	Ex 11	Ex 11	Ex 11	Ex 11	Ex 11	Ex 11
29-4-26	Ex 12	Ex 12	Ex 12	Ex 12	Ex 12	Ex 12	Ex 12	Ex 12	Ex 12	Ex 12
13-5-26	REPITION LAB									
3-6-26	Internal Exam and Viva - Voce									

Lab Occupancy Time Table (B.Tech II Sem: Section – A/ S)

↓Day/Date→	1	2	3		4	5	6
Monday				**LUNCH**			
Tuesday							
Wednesday					**EM LAB**		
Thursday							
Friday							
Saturday							

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 = **B**	1,2,3,4,5,6,7,8	B = 05
Internal Test / Viva = **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 **Procedure: 20 M; Experimental Work & Results: 30 M; Viva – Voce: 20 M**	1,2,3,4,5,6,7,8	**D = 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 build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.
PEO 2	To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.
PEO 3	To develop inquisitiveness towards good communication and lifelong learning.

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 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 the Aerospace vehicle design
PSO 2	To prepare the students to work effectively in Aerospace and Allied Engineering organizations

Title	Course Instructor	Module Coordinator	Head of the Department
Name of the Faculty			
Signature			