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

COURSE HANDOUT
PART-A

Name of Course Instructor: Mr. A. S. R. C. Murthy.
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /A **A.Y.:** 2024-25

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):
The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.
COURSE OUTCOMES (COs): At the end of the course, student will be able to

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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				-	-	-	-	-	-		2	2	2
CO2	3	2	2	1		-	-	-	-	-	-		2	2	3
CO3	3	2	2	1		-	-	-	-	-	-		3	3	3
CO4	3	2	2	1		-	-	-	-	-	-		3	3	3
CO5	3	2	2	1		-	-	-	-	-	-		2	3	3
1 - Low				**2 –**Medium							**3 -** High				

TEXTBOOKS:

T1	Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
T2	Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1	Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
R2	C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
R3	Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
R4	Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
R5	Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	22-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	23-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	24-01-2025		TLM1	
4.	Overview of time and space complexity	1	25-01-2025		TLM1	
5.	Analysis of Liner Data structures	2	29-01-2025 30-01-2025		TLM1	
6.	Revise Arrays	1	31-01-2025		TLM1	
7.	Searching Techniques: Linear Search	1	01-02-2025		TLM1	
8.	Binary Search & Analysis	2	05-02-2025 06-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	07-02-2025		TLM1	
10.	Insertion Sort & Analysis	2	08-02-2025 12-02-2025		TLM1	
11.	Selection Sort & Analysis	2	13-02-2025 14-02-2025		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	15-02-2025		TLM1	
13.	Linked List Representation	1	19-02-2025		TLM1	
14.	Sing Linked List : Operations	2	20-02-2025 21-02-2025		TLM1	
15.	Double Linked List : Operations	2	22-02-2025 27-02-2025		TLM1	
16.	Circular Single Linked List	1	28-02-2025		TLM1	
17.	Circular Double Linked List	2	01-03-2025 05-03-2025		TLM1	
18.	Comparing Arrays and Linked List	1	06-03-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	07-03-2025		TLM1	
20.	Polynomial Addition	1	08-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

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.	Introduction to Stacks : Properties	1	19-03-2025		TLM1	
22.	Operations of Stacks	1	20-03-2025		TLM1	
23.	Implementation of stacks using arrays	1	21-03-2025		TLM1	
24.	Stacks using Linked List	1	22-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	26-03-2025 27-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	28-03-2025 29-03-2025		TLM1	
27.	Checking Balanced Parenthesis	2	04-04-2025 09-04-2025		TLM1	
28.	Reversing a List	1	10-04-2025		TLM1	

29.	Backtracking	1	11-04-2025		TLM1	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	12-04-2025		TLM1	
31.	Implementing queues using arrays	1	16-04-2025		TLM1	
32.	Implementing queues using Linked List	1	17-04-2025		TLM1	
33.	Applications of Queue : Scheduling	1	19-04-2025		TLM1	
34.	Breadth First Search	1	23-04-2025		TLM1	
35.	Circular Queue	1	24-04-2025		TLM1	
36.	Double ended queue	1	25-04-2025		TLM1	
37.	Applications of Deque	1	26-05-2025		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	30-04-2025		TLM1	
39.	Representation of Trees	1	01-05-2025		TLM1	
40.	Tree Traversals	1	02-05-2025		TLM1	
41.	Binary Search Trees- Operations	2	03-05-2025 07-05-2025		TLM1	
42.	Hashing Introduction	1	08-05-2025		TLM1	
43.	Hash Functions	1	09-05-2025		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	10-05-2025		TLM1	
45.	Open Addressing: Linear Probing	1	14-05-2025		TLM1	
46.	Quadratic Probing, Double Hashing	1	15-05-2025		TLM1	
47.	Rehashing, Applications of Hashing	1	16-05-2025		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	1	17-05-2025					
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/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 modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. A. S. R. C. Murthy**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. D.Veeraiah**
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A. S. R. C. Murthy
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/A **A.Y.:** 2024-25

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	HOD Sign
1.	Array Manipulations	3	24-01-2025		
2.	Searching and Sorting Techniques	3	31-01-2025		
3.	Single Linked List	3	07-02-2025		
4.	Double Linked List	3	14-02-2025		
5.	Circular Linked List	3	21-02-2025		
6.	Polynomial Representation & Polynomial Addition	3	28-02-2025		
7.	Linked List Applications	3	07-03-2025		
8.	Stack Implementation	3	21-03-2025		
9.	Stack Applications	3	28-03-2025		
10.	Queue Implementation & Circular Queue	3	04-04-2025		
11.	Double Ended Queue	3	11-04-2025		
12.	Trees	3	25-04-2025		
13.	Trees	3	02-05-2025		
14.	Hashing	3	09-05-2025		
15.	Internal Exam	3	16-05-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work + Record	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mr. A. S. R. C. Murthy	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE- A
ACADEMIC YEAR	**:** 2024-25
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:**Dr. K.R. Kavitha
COURSE COORDINATOR	**:** Dr. K.R. Kavitha
PRE-REQUISITES	**:** Basics ofVectors**,** 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", 44ndEdition, 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	21-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	22-01-2025		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	23-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	24-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	25-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	28-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	29-01-2025		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	30-01-2025		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	31-01-2025		TLM3	CO1	T1,T2	
10.	Non-exact DE Type II	1	01-02-2025		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	04-02-2025		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	05-02-2025		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	06-02-2025		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	07-02-2025		TLM3	CO1	T1,T2	
15.	Law of natural growth and decay	1	11-02-2025		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	12-02-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	13-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	14-02-2025		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	15-02-2025		TLM1	CO1	T1,T2	
20.	P.I for Cosbx, or sinbx	1	18-02-2025		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	19-02-2025		TLM1	CO1	T1,T2	
22.	P.I for $e^{ax+b}v(x)$	1	20-02-2025		TLM1	CO1	T1,T2	
23.	TUTORIAL - 3	1	21-02-2025		TLM3	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	22-02-2025		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	25-02-2025		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	27-02-2025		TLM1	CO1	T1,T2	
27.	TUTORIAL - 4	1	28-02-2025		TLM3	CO1	T1,T2	

28.	Simultaneous linear equations	1	01-03-2025		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	04-03-2025		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	05-03-2025		TLM1	CO1	T1,T2	
31.	TUTORIAL - 5	1	07-03-2025		TLM3	CO1	T1,T2	
32.	Revision	1	06-03-2025					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	18-03-2025		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	19-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	21-03-2025		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
38.	Lagrange’s Method	1	25-03-2025		TLM1	CO2	T1,T2	
39.	Lagrange’s Method	1	26-03-2025		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	27-03-2025		TLM1	CO2	T1,T2	
41.	TUTORIAL - 6	1	28-03-2025		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	29-03-2025		TLM1	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	01-04-2025		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	02-04-2025		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	03-04-2025		TLM1	CO3	T1,T2	
46.	TUTORIAL - 7	1	04-04-2025		TLM3	CO3	T1,T2	
47.	Gradient	1	08-04-2025		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	09-04-2025		TLM1	CO3	T1,T2	
49.	Divergence	1	10-04-2025		TLM1	CO3	T1,T2	
50.	TUTORIAL - 8	1	11-04-2025		TLM3	CO3	T1,T2	
51.	Curl	1	15-04-2025		TLM1	CO3	T1,T2	

52.	Solenoidal fields, Irrotational fields, potential surfaces	1	16-04-2025		TLM1	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	17-04-2025		TLM1	CO3	T1,T2	
54.	Laplacian, second order operators	1	19-04-2025		TLM1	CO3	T1,T2	
55.	Vector Identities	1	22-04-2025		TLM1	CO3	T1,T2	
56.	Vector Identities	1	23-04-2025		TLM1	CO3	T1,T2	
57.	TUTORIAL - 9	1	25-04-2025		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
59.	Introduction to Unit-V	1	24-04-2025		TLM1	CO4	T1,T2	
60.	Line Integral	1	26-04-2025		TLM1	CO4	T1,T2	
61.	Circulation	1	29-04-2025		TLM1	CO4	T1,T2	
62.	Work done	1	30-04-2025		TLM1	CO4	T1,T2	
63.	Surface Integral, Flux	1	01-05-2025		TLM1	CO4	T1,T2	
64.	TUTORIAL - 10	1	02-05-2025		TLM3	CO4	T1,T2	
65.	Volume Integral	1	03-05-2025		TLM1	CO4	T1,T2	
66.	Green’s Theorem	1	06-05-2025		TLM1	CO4	T1,T2	
67.	Green’s Theorem	1	07-05-2025		TLM1	CO4	T1,T2	
68.	Stoke’s Thoerem	1	08-05-2025		TLM1	CO4	T1,T2	
69.	TUTORIAL - 11	1	09-05-2025		TLM3	CO4	T1,T2	
70.	Divergence Theorem	1	13-05-2025		TLM1	CO4	T1,T2	
71.	Divergence Theorem	1	14-05-2025		TLM1	CO4	T1,T2	
72.	Revision	1	15-05-2025					
No. of classes required to complete UNIT-V		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
73.	Non-homogeneous Linear PDE with constant coefficients	2	17-05-2025, 16-05-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=5

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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Phone: 08659-222933, Fax: 08659-222931
DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

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/CSE II SEM A SECTION **A.Y.:** 2024-25

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	3	2	3	_	_	_	_	_	_	_	_	1
CO 2	2	2	_	_	_	_	_	_	_	_	_	_
CO 3	2	2	_	_	_	3	_	_	_	_	2	2
CO 4	3	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):

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	20-01-2025		TLM1	
2.	Ohm’s Law and its limitations	1	21-01-2025		TLM1	
3.	KCL & KVL	1	22-01-2025		TLM1	
4.	series, parallel, series-parallel circuits	1	25-01-2025		TLM1	
5.	Problems	1	27-01-2025		TLM3	
6.	Super Position theorem	1	28-01-2025		TLM1	
7.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	29-01-2025		TLM2	
8.	average value, RMS value, form factor, peak factor	1	01-02-2025		TLM1	
9.	RLC Circuits	1	03-02-2025		TLM1	
10.	Impedance, Power	1	04-02-2025		TLM1	
11.	Problems	1	05-02-2025		TLM3	
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	1	8-02-2025		TLM2	
13.	Construction, principle and operation of (ii) DC Generator.		10-02-2025		TLM2	
14.	Single Phase Transformer	1	11-02-2025		TLM2	
15.	Three Phase Induction Motor	1	12-02-2025		TLM2	
16.	Alternators	1	15-02-2025		TLM2	
17.	Applications of electrical machines	1	17-02-2025		TLM2	
18.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	18-02-2025		TLM2	
19.	Moving Iron (MI) Instruments	1	19-02-2025		TLM2	
20.	Wheat Stone bridge	1	22-02-2025		TLM2	
21.	Problems	1	24-02-2025		TLM3	
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
22.	Conventional and non-conventional energy resources	1	25-02-2025		TLM2	
23.	Hydel & Nuclear power generation	1	26-02-2025		TLM2	
24.	Solar & Wind power plants	1	01-03-2025		TLM2	
25.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	03-03-2025		TLM2	
26.	Definition of “unit” used for consumption of electrical energy, two-part electricity tariff,	1	04-03-2025		TLM2	
27.	calculation of electricity bill for domestic consumers. Working principle of Fuse and Miniature circuit breaker (MCB	1	05-03-2025		TLM2	
28.	merits and demerits. Personal safety measures: Electric ShockEarthing and its types& Safety Precaution	1	8-03-2025		TLM2	
No. of classes required to complete UNIT-III: 9				**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.
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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.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	DrA.V.G.A.MARTHANDA	Dr A.V.G.A.MARTHANDA	**Dr.G.Nageswara Rao**	**Dr.JSV prasad**
Signature				

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr A.V.G.A.MARTHANDA Dr.M.Uma Vani

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

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

Program/Branch/Sem/Sec: B.Tech/CSE, II SEM A section **A.Y.:** 2024-25

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

COURSE DELIVERY PLAN (LESSON PLAN): ELECTRICAL ENGINEERING

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 PRECUATIONS & Other suggestions.	3	22-01-2025		TLM4	
2.	Verification of KCL and KVL	3	29-01-2025		TLM4	
3.	Verification of Superposition theorem	3	05-02-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	05-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	12-02-2025		TLM4	

6.	Measurement of Power and Power factor using Single-phase wattmeter	3	19-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	26-02-2025		TLM4	
8.	Internal Lab Examination (**Electrical**)	3	05-03-2025		TLM4	
No. of classes required: 21				**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	**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.
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
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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.
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PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
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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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.AVGAM,Dr.MUV, Dr.PSR,Mr.AVRK	Dr. A.V.G.A.MARTHANDA	Dr.G.NAGESWARA RAO	Dr.J.S.V.PRASAD
Signature				

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**:I B.Tech.,II-Sem.,CSE-A**
ACADEMICYEAR	**:2024-25**
COURSENAME &CODE	**: ENGINEERING PHYSICS**
L-T-PSTRUCTURE	**:4-0-0**
COURSECREDITS	**3**
COURSEINSTRUCTOR	**:Dr. P. Sobhanachalam**
PRE-REQUISITE	**:Basic Knowledge of Physics**

Course Objectives:

To bridge the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

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

CO1	Analyze the intensity variation of light due to interference, diffraction and Polarization (Apply)
CO2	Understand the basics of crystals and their structures (Understand)
CO3	Summarize various types of polarization of dielectrics and classify the magnetic materials (Understand)
CO4	:xplain fundamentals of quantum mechanics and free electron theory of metals (Understand)
CO5	Identify the type of semiconductor using Hall Effect (Apply)

COURSEARTICULATIONMATRIX(Correlation between COs, Pos & PSOs):

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1. →	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**						**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

TEXT BOOKS

1. A Text book of "Engineering Physics" M.N. Avadhanulu, P.G. Kshirsagar, TVS Arun Murthy, S. Chand & Co., 11th Edition, 2019.
2. Engineering Physics – *D.K. Bhattacharya & Poonam Tandon, Oxford press (2015)*

REFERENCES

1. Engineering Physics -B.K.Pandey& S. Chaturvedi, Cengage Learning 2021.
2. Engineering Physics -Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. Engineering Physics -Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press 2010.
4. Engineering Physics -M.R. Srinivasan, New Age international publishers (2009).

WEBRESOURCES

1. http://www.loc.gov/rr/scitech/selected-internet/physics.html
2. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
3. http://physicsdatabase.com/free-physics-books/
4. http://www.e-booksdirectory.com
5. http://www.thphys.physics.ox.ac.uk

TEACHINGLEARNINGMETHODS			
TLM-1	Chalk and Talk	**TLM-4**	Demonstration(Lab/Field Visit)
TLM-2	PPT/A illustrations	**TLM-5**	ICT(NPTEL/Swayam Prabha /MOOCS)
TLM-3	Tutorial/Quiz/Assignment	**TLM-6**	Group Discussion/Project

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE,DIFFRACTION& POLARIZATION

Course Outcome :-CO1;TextBook:-T1,R2

S.No.	**Topics to be covered**	**No.of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign**	**Remarks**
1.	Introduction to the Subject, Course Outcomes	1	21.1.25		**TLM-2**		
2.	Principle of superposition, Interference of light	1	23.1.25		**TLM-3**		
3.	Interference in thin films by reflection & applications	1	24.1.25		**TLM-2**		
4.	Colors in thin films, Newton's rings	1	28.1.25		**TLM-1**		
5.	Determination of wav and refractive index	1	30.1.25		**TLM-4**		
6.	Problems& Assignment/Quiz	1	31.1.25		**TLM-1**		
7.	Introduction, Fresnel and Fraunhoffer diffractions	1	1.2.25		**TLM-3**		

8.	Fraunhoffer diffraction due to single slit	1	4.2.25		**TLM-2**		
9.	Double slit& N slits(Qualitative)	1	6.2.25		**TLM-4**		
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	7.2.25		**TLM-4**		
11.	Problems& Assignment/Quiz	1	8.2.25		**TLM-3**		
12.	Introduction – Types of polarization	1	11.2.25		**TLM-2**		
13.	Polarization by reflection, refraction & double refraction	1	13.2.25		**TLM-2**		
14.	Nicol's prism	1	14.2.25		**TLM-5**		
15.	Half wave and Quarter wave plates	1	15.2.25		**TLM-2**		
16.	Problems& Assignment/Quiz	1	18.2.25		**TLM-3**		
No.of classes required to complete UNIT-I:16				No.of classes taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

Course Outcome :-CO2;TextBook:-T1,R2

S.No.	**Topics to be covered**	**No.of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign**	**Remarks**
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	20.2.25		**TLM-3**		
2.	Bravais Lattices	1	21.2.25		**TLM-2**		
3.	Crystal Systems(3D)	1	22.2.25		**TLM-2**		
4.	Coordination number – Packing fraction of –SC, BCC	1	25.2.25		**TLM-1**		
5.	Coordination number – Packing fraction of FCC	1	27.2.25		**TLM-1**		
6.	Miller indices& Properties	1	28.2.25		**TLM-2**		
7.	Separation between successive (hkl) planes	1	1.3.25		**TLM-1**		
8.	Bragg's law; X–ray Diffractometer	1	4.3.25		**TLM-3**		
9.	Crystal Structure determination by Laue's method	1	6.3.25		**TLM-2**		

10.	Crystal Structure determination by Powder method	1	7.3.25		**TLM-5**		
11.	Problems& Assignment/Quiz	1	8.3.25		**TLM-3**		
12.	MID-1 Examinations	1	11.4.25		**----**		
13.	MID-1 Examinations	1	13.3.25		**----**		
14.	MID-1 Examinations	1	15.3.25		**----**		
No.of classes required to complete UNIT-II: 14				No.of classes taken:			

UNIT-III :DIELECTRIC & MAGNETIC MATERIALS

Course Outcome :-CO3;TextBook:-T1,R2

S.No	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dielectric polarization Dielectric polarizability, Susceptibility	1	18.3.25		**TLM-2**		
2.	Dielectric constant & Displacement Vector, Relation between the electric vectors	1	20.3.25		**TLM-3**		
3.	Types of polarizations- Electronic polarization	1	21.3.25		**TLM-1**		
4.	Types of polarizations- ionic & orientation polarizations (Qualitative)	1	22.3.25		**TLM-1**		
5.	Lorentz internal field	1	25.3.25		**TLM-2**		
6.	Claussius-Mosotti equation, Complex dielectric constant	1	27.3.25		**TLM-1**		
7.	Frequency dependence of polarization dielectric loss	1	28.3.25		**TLM-5**		
8.	Problems& Assignment/Quiz	1	29.3.25		**TLM-3**		
9.	Introduction Magnetic dipole moment, Magnetization Magnetic susceptibility & permeability	1	1.4.25		**TLM-4**		

10.	Atomic origin of magnetism	1	3.4.25		**TLM-1**		
11.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	4.4.25		**TLM-2**		
12.	Domain concept for Ferromagnetism & Domain walls	1	8.4.25		**TLM-2**		
13.	Hysteresis	1	10.4.25		**TLM-5**		
14.	soft and hard magnetic materials	1	11.4.25		**TLM-1**		
15.	Problems& Assignment/Quiz	1	12.4.25		**TLM-3**		
No.of classes required to complete UNIT-III:15				No.of classes taken:			

UNIT-IV :QUANTUM MECHANICS&FREEELECTRONTHEORY

Course Outcome :-CO4;TextBook:-T1,R2

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter,De-Broglie's Hypothesis	1	15.4.25		**TLM-2**		
2.	Heisenberg's Uncertainty Principle	1	17.4.25		**TLM-2**		
3.	Significance & properties of wave function	1	19.4.25		**TLM-2**		
4.	Schrodinger's time independent and dependent wave equations	1	22.4.25		**TLM-1**		
5.	Particle in a one – dimensional infinite potential well	1	24.4.25		**TLM-1**		
6.	Problems& Assignment/Quiz	1	25.4.25		**TLM-3**		
7.	Classical free electron theory- merits and demerits, Quantum free electron theory	1	26.4.25		**TLM-2**		
8.	Electrical conductivity based on quantum free electron theory	1	29.4.25		**TLM-1**		
9.	Fermi -Dirac distribution and temperature dependence	1	1.5.25		**TLM-5**		
10.	Density of states, Fermi energy	1	2.5.25		**TLM-1**		

11.	Problems& Assignment/Quiz	1	3.5.25		TLM-3		
No.of classes required to complete UNIT-IV:11				No.of classes taken:			

UNIT-V:SEMICONDUCTORPHYSICS

Course Outcome :-CO5;TextBook:-T2,R1

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Formation of energy bands, Classification of crystalline solids	1	6.5.25		**TLM-6**		
2.	Intrinsic semiconductors, Density of charge carriers	1	8.5.25		**TLM-1**		
3.	Electrical conductivity, Fermi level	1	9.5.25		**TLM-2**		
4.	Extrinsic semiconductors, Density of charge carriers	1	10.5.25		**TLM-1**		
5.	Dependence of Fermi energy on carrier concentration &temperature	1	13.5.25		**TLM-2**		
6.	Drift and Diffusion Currents, Einstein's equation	1	15.5.25		**TLM-1**		
7.	Hall Effect & its applications	1	16.5.25		**TLM-4**		
8.	Problems& Assignment/Quiz	1	17.5.25		**TLM-3**		
9.	MID-2 Examinations	1	3.6.25		**----**		
10.	MID-2 Examinations	1	5.6.25		**----**		
11.	MID-2 Examinations	1	6.6.25		**----**		
No.of classes required to complete UNIT-V:11				No.of classes taken:			

PART-C

EVALUATION PROCESS(R-23Regulation)

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

PROGRAMMEOUTCOMES(POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineeringfundamentals,andanengineeringspecializationtothesolutionofcomplex engineeringproblems.
PO 2	**Problemanalysis**:Identify,formulate,reviewresearchliterature,andanalyze complexengineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics,naturalsciences,and engineeringsciences.
PO 3	**Design/developmentofsolutions**:Designsolutionsforcomplexengineeringproblems and design system components or processes that meet the specified needswithappropriateconsiderationforthepublichealthandsafety,andthecultural, societal,andenvironmentalconsiderations.
PO 4	**Conductinvestigationsofcomplexproblems**:Useresearch-basedknowledgeand researchmethodsincludingdesignofexperiments,analysisandinterpretationofdata,andsynthesisoftheinformationtoprovidevalidconclusions.
PO 5	**Moderntoolusage**:Create,select,andapplyappropriatetechniques,resources,and modernengineeringandITtoolsincludingpredictionandmodelingtocomplexengineeringactivitieswithanunderstandingofthe limitations
PO 6	**The engineer and society**:Apply reasoninginformedby the contextual knowledgetoassesssocietal,health,safety,legalandculturalissuesandtheconsequent responsibilitiesrelevanttotheprofessionalengineeringpractice
PO 7	**Environmentandsustainability**:Understandtheimpactoftheprofessionalengineeringsolutionsinsocietalandenvironmentalcontexts,anddemonstratethe knowledgeof,andneed forsustainabledevelopment.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilitiesandnormsoftheengineeringpractice.
PO 9	**Individualandteamwork**:Functioneffectivelyasanindividual,andasamember orleaderindiverseteams,andinmultidisciplinarysettings.
PO 10	**Communication**: Communicate effectively on complex engineering activities withtheengineeringcommunityandwithsocietyatlarge,suchas,beingabletocomprehendandwriteeffectivereportsanddesigndocumentation,makeeffective presentations,andgiveandreceiveclearinstructions.
PO 11	**Projectmanagementandfinance**: Demonstrate knowledge andunderstandingofthe engineering and management principles and apply these to one’s own work, as amemberandleaderinateam,tomanageprojectsandinmultidisciplinary environments.
PO 12	**Life-longlearning**:Recognizetheneedforandhavethepreparationandabilityto engageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

CourseInstructor	CourseCoordinator	ModuleCoordinator	HOD
Dr. P. Sobhanachalam	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.A.RAMIREDDY**

FRESHMANENGINEERINGDEPARTMENT

<u>COURSEHANDOUT</u>

Part-A

PROGRAM	:	**B.Tech.,II-Sem.,CSE-A**
ACADEMICYEAR	:	**2024-25**
COURSENAME &CODE	:	**ENGINEERING PHYSICS LAB**
L-T-PSTRUCTURE	:	**0 – 0 – 3**
COURSECREDITS	:	**1**
COURSEINSTRUCTOR	:	**Dr. P. Sobhanachalam / Prof. S. Yusub**
COURSECOORDINATOR	:	
Pre-requisites	:	**Nil**

Course Objective: To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:

CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

Course articulation matrix (Correlation between CO's and PO's):

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO2.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

List of Experiments

1. Determination of radius of curvature of a given Plano - Convex lens by Newton's rings.
2. Determination of dielectric constant using charging and discharging method.
3. Determination of wavelength of a laser light using diffraction grating.
4. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
5. Determination of temperature coefficients of a thermistor.
6. Determination of acceleration due to gravity and radius of Gyration by using a compound
pendulum.
7. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.
8. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
9. Sonometer- Verification of laws of a stretched string.
10. Determination of energy band gap of a semiconductor using p-n junction diode.
11. Verification of Brewster's Law.
12. Determination of Hall coefficient and Hall voltage.

References:

- A Textbook of Practical Physics – S. Balasubramanian, M.N. Srinivasan, S. Chand publishers-2017.

BOSAPPROVEDTEXTBOOKS:

1. LabManualPreparedbytheLBRCE.

EVALUATIONPROCESS:

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

Part-B

COURSEDELIVERYPLAN (LESSONPLAN): CSE-A

S.No.	**Topics to be covered**	**No. of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**TeachingLearning Methods**	**LearningOutcomeCOs**	**Text Book followed**	**HOD Sign**
1.	Introduction & Demonstration	3	20.1.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	

2.	Experiment1	3	27.1.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
3.	Experiment2	3	3.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
4.	Experiment3	3	10.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
5.	Experiment 3	3	17.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
6.	Experiment 4	3	24.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
7.	Experiment5	3	3.3.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
8.	**MID-1 Exam**	3	10.3.25		**---**	**---**	---	
9.	Experiment 6	3	17.3.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
10.	Experiment 7	3	24.3.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
11.	Experiment8	3	7.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
12.	Experiment 8	3	21.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
13.	Experiment 9	3	28.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
14.	**Internal Exam**	3	5.5.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
15.	**Internal Exam**	3	12.5.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
16.	**MID-2 Exam**	3	2.6.25		**---**	**---**	---	
No.of classes required to completelab		15			No.of classes taken:			

PROGRAM OUT COMES: Engineering Graduates will be able to:

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

(2).**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

(3).**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

(4). **Conduct investigations ofcomplex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of theinformationto provide valid conclusions.

(5). **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modeling to complex engineering activities with anunderstandingofthelimitations.

(6). **The engineer and society**: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

(7). Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable .

(8). Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

(9). **Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams and in multi disciplinary settings.

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

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

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

CourseInstructor	CourseCoordinator	ModuleCoordinator	HOD
Dr. P. Sobhanachalam	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.A.RAMIREDDY**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME) under Tier - I
Approved by AICTE and Permanently Affiliated to JNTUK, Kakinada

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, Computer Science Engineering
ACADEMIC YEAR : 2024-25
COURSE NAME & CODE : Engineering Workshop, 23ME51
L-T-P STRUCTURE : 0-0-3
COURSE CREDITS : 1.5
COURSE INSTRUCTOR : Dr.B.Sudheer Kumar, Sr.Asst. Professor
Mrs.B.Kamala Priya, Asst. Professor
COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor
PRE REQUISITE: Knowledge in dimensions and units, Usage of geometrical instruments and analytical ability

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	LabManual

COURSE DELIVERY PLAN (LESSON PLAN): Section-D

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	21-01-2025		TLM8	-	
2.	Experiment-1	3	28-01-2025		TLM8	R1	
3.	Experiment-2	3	04-02-2025		TLM8	R1	
4.	Experiment-3	3	11-02-2025		TLM8	R1	
5.	Experiment-4	3	18-02-2025		TLM8	R1	
6.	Experiment-5	3	25-02-2025		TLM8	R1	
7.	Experiment-6	3	04-03-2025		TLM8	R1	
I-Mid Examinations (10.03.2025 to 15.03.2025)							
8.	Experiment-7	3	18-03-2025		TLM8	R1	
9.	Experiment-8	3	25-03-2025		TLM8	R1	
10.	Experiment-9	3	01-04-2025		TLM8	R1	
11.	Experiment-10	3	08-04-2025		TLM8	R1	
12.	Additional Experiments	3	15-04-2025		TLM8	R1	
13.	Additional Experiments	3	22-04-2025		TLM8	R1	
14.	Repetition lab	3	29-04-2025		TLM8	R1	
15.	Repetition lab	3	06-05-2025		TLM8	R1	
16.	Lab Internal	3	13-05-2025		TLM6	-	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical’s	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: A-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B11	23761A0529, 24761A0501-512	13	B21	23761A0529, 24761A0501-512	13
B12	24761A0513-525	13	B22	24761A0513-525	13
B13	24761A0526-538	13	B23	24761A0526-538	13
B14	24761A0539-551	13	B24	24761A0539-551	13
B15	24761A0552-565	14	B25	24761A0552-565	14

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

LIST OF EXPERIMENTS:

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

	Bell Circuit	

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

member and leader in a team, to manage projects and in multi disciplinary environments.

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	Course Coordinator	Module Coordinator	HOD
Dr.B.Sudheer Kumar Mrs.B.Kamala Priya	Mr.S.Srinivasa Reddy	Mr.J.Subba Reddy	Dr. M. B. S Sreekara Reddy

DEPARTMENT OF MECHANICAL ENGINEERING
COURSE HANDOUT

PART-A

Name of Course Instructor: **Dr. B. Sudheer Kumar, Sr.Asst.Professor,**
Dr. A.Nageswara Rao, Sr. Asst. Professor,
Dr. A. Dhanunjaya Kumar, Sr. Asst. Professor

Course Name & Code	**:** Engineering Drawing – 23ME01	
L-T-P Structure	**:** 3-0-4	**Credits:** 4
Program/Sem/Sec	: B.Tech/II Sem	**A.Y.:** 2024-25

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Understand the principles of engineering drawing, including engineering curves, scales, Orthographic and isometric projections. (**Understanding Level –L2**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Applying Level –L3**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Applying Level –L3**)
CO4	Draw the development of surfaces of simple objects. (**Applying Level –L3**)
CO5	Prepare isometric and orthographic sections of simple solids. (**Applying Level –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	2	-	-	-	-	-	-	-	-	3	2	1	2
CO2	3	2	1	2	-	-	-	-	-	-	-	3	1	1	2
CO3	3	2	2	-	-	-	-	-	-	-	-	3	-	1	2
CO4	3	2	2	-	-	-	-	-	-	-	-	3	2	1	2
CO5	3	2	2	-	-	-	-	-	-	-	-	3	-	-	-
			1 - Low				**2** –Medium					**3 -** High			

TEXTBOOKS:

T1 N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar publishers,2012

REFERENCE BOOKS:

R1 Narayana K L, Kannaiah P, Textbook on Engineering Drawing, 2nd Edition, SciTech publishers.

R2 R.K.Dhawan, Engineering Drawing, S.Chand Company LTD.

R3 Venugopal, Engineering Drawing and Graphics, New Age publishers

R4 Dhananjay A. Jolhe, Engineering Drawing, Tata McGraw Hill Publishers

R5 N.S.Parthasarathy, Vela Murali, Engineering Drawing, Oxford Higher Education

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, LINES ANDDIMENSIONING, CONICS, CYCLOIDS, INVOLUTES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
1	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, CEOs, COs, PEOs, and POs and PSOs	3	21-01-2025		TLM1/ TLM2	
2	Principles of Engineering Graphics and their significance, Drawing Instruments and their use- Conventions in Drawing – Practical orientation					
3	Lettering and Dimensioning – BIS Conventions- Geometrical Constructions – Theory Class					
4	Practice	2	23-01-2025		TLM4	
5	Engineering Curves: Conic Sections- Construction of ellipse, parabola and Hyperbola –Theory class	3	28-01-2025		TLM1/ TLM2	
6	Construction of Parabola, ellipse, hyperbola – General method -Practice	2	30-01-2025		TLM4	
7	Cycloids and Involutes–Theory class	3	04-02-2025		TLM1/ TLM5	
8	Construction of Cycloids and Involutes – Practice	2	06-02-2025		TLM4	
No. of classes required to complete UNIT-I: 18 (Lecture:6 Practice:12)				**No. of classes taken: (including Practice)**		

UNIT-II: PROJECTIONS OF POINTS, LINES AND PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
9	Orthographic Projections, First and third angle projection methods, Projections of Points, Lines inclined to one plane	2	11-02-2025		TLM1/ TLM2	
10	Practice	3	13-02-2025		TLM4	
11	Projection of lines - Projections of Straight Line Inclined to both the reference planes	3	18-02-2025		TLM1/ TLM2	
12	Practice	2	20-02-2025		TLM4	
13	Projections of planes- Regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.	3	25-02-2025		TLM1/ TLM2	
14	Practice	2	27-02-2025		TLM4	
15	Revision	3	04-03-2025		TLM1/ TLM2	
No. of classes required to complete UNIT-II: 15 (Lecture:6 Practice:9)				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
16	Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane – Theory and practice	2	06-03-2025		TLM1/ TLM2/ TLM4	
17	Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.	3	18-03-2025		TLM1/ TLM2	
18	Practice Session	2	20-03-2025		TLM 4	
No. of classes required to complete UNIT-III: 08 (Lecture:3 Practice:5)				**No. of classes taken:(including Practice)**		

UNIT-IV: SECTIONS OF SOLIDS AND DEVELOPMENT OF SURFACES

S. No.	Topics to be covered	No. of Class Required	Tentative Date	Actual Date	Teaching Learning Method	HOD Sign Weekly
19	Sections of Solids Solids in simple positions, Perpendicular and inclined section planes	3	25-03-2025		TLM1/ TLM2	
20	Practice Session	2	27-03-2025		TLM4	
21	Sections of solids: Sectional views and True shape of section	3	01-04-2025		TLM1/ TLM2	
22	Practice	2	03-04-2025		TLM4	
23	Development of solids Methods of Development: Parallel line development and radial line development	3	08-04-2025		TLM1/ TLM2	
24	Practice	2	10-04-2025		TLM4	
25	Development of solids Development of a cube, prism, cylinder, pyramid and cone.	3	15-04-2025		TLM4	
No. of classes required to complete UNIT-IV: 18 (Lecture:6 Practice:12)				**No. of classes taken: (including Practice)**		

UNIT-V: CONVERSION OF VIEWS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
26	Introduction to Isometric Views – Theory Isometric views, isometric axes, scale, lines & planes	2	17-04-2025		TLM1/ TLM2	
27	Practice	3	22-04-2025		TLM4	
28	Orthographic projections to Isometric Projections	2	24-04-2025		TLM1/ TLM2	
29	Practice	3	29-04-2025		TLM4	
30	Orthographic Projections to Isometric Projections	2	01-05-2025		TLM1/ TLM2	

31	Practice	3	06-05-2025		TLM4	
32	**Content beyond the syllabus:** Scales, Planes inclined to both the planes.	2	08-05-2025		TLM1/ TLM2	
33	Revision of I Unit	3	13-05-2025		TLM1	
34	Revision of II Unit	2	15-05-2025		TLM1/ TLM2	
35	Revision of III Unit	3	20-05-2025		TLM1/ TLM2	
36	Revision of IV Unit	2	22-05-2025		TLM1/ TLM2	
37	Revision of V Unit	3	27-05-2025		TLM1/ TLM2	
No. of classes required to complete UNIT-V: 20 (Lecture:12 Practice:15)				**No. of classes taken:**		

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**
I-Descriptive Examination (Units-I, II)	M1=15
II- Descriptive Examination (UNIT-III , IV & V)	M2=15
Day to Day Evaluation (Assignment)	15
Mid Marks =80% of Max (M1,M2)+ 20% of Min ((M1, M2) + Day to Day Evaluation	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):
Engineering Graduates will be able to:

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, andan 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 anunderstanding 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):

PSO1	**To apply the principles of thermal sciences to design and develop various thermal systems.**
PSO2	**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.**
PSO3	**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	Course Coordinator	Head of the Department
Name of the Faculty	Dr.B.Sudheer Kumar	Mr.J.Subba Reddy	Dr. M B S S Reddy
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(An Autonomous Institution since 2010)
Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
L.B. Reddy Nagar, Mylavaram, NTR District, Andhra Pradesh - 521230

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	**: I B.Tech., I-Sem., CSE-B**
ACADEMIC YEAR	**: 2024-25**
COURSE NAME & CODE	**: ENGINEERING PHYSICS**
L-T-P STRUCTURE	**: 4-0-0**
COURSE CREDITS	**3**
COURSE INSTRUCTOR	**: Dr. N. T. SARMA**
PRE-REQUISITE	**: Basic Knowledge of Physics**

Course Objectives:

To bridge the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

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

CO 1	Analyze the intensity variation of light due to interference, diffraction and Polarization (Apply)
CO 2	Understand the basics of crystals and their structures (Understand)
CO 3	Summarize various types of polarization of dielectrics and classify the magnetic materials (Understand)
CO 4	Explain fundamentals of quantum mechanics and free electron theory of metals (Understand)
CO5	Identify the type of semiconductor using Hall Effect (Apply)

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

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO’s	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1. →	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**						**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

TEXT BOOKS

1. A Text book of "Engineering Physics" M.N. Avadhanulu, P.G. Kshirsagar, TVS Arun Murthy, S. Chand & Co., 11th Edition, 2019.
2. Engineering Physics – *D.K. Bhattacharya & Poonam Tandon, Oxford press (2015)*

REFERENCES

1. Engineering Physics - B.K.Pandey & S. Chaturvedi, Cengage Learning 2021.
2. Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. Engineering Physics - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press 2010.
4. Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

WEB RESOURCES

1. http://www.loc.gov/rr/scitech/selected-internet/physics.html
2. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
3. http://physicsdatabase.com/free-physics-books/
4. http://www.e-booksdirectory.com
5. http://www.thphys.physics.ox.ac.uk

TEACHING LEARNING METHODS			
TLM-1	Chalk and Talk	**TLM-4**	Demonstration (Lab/Field Visit)
TLM-2	PPT/AV illustrations	**TLM-5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM-3	Tutorial/Quiz/Assignment	**TLM-6**	Group Discussion/Project

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTERFERENCE, DIFFRACTION & POLARIZATION

Course Outcome :- CO 1; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	14/01/2025		**TLM-2**		
2.	Principle of superposition, Interference of light	1	15/01/2025		**TLM-3**		
3.	Interference in thin films by reflection & applications	1	17/01/2025		**TLM-2**		
4.	Colors in thin films, Newton's rings	1	18/01/2025		**TLM-1**		
5.	Determination of wavelength and refractive index	1	21/01/2025		**TLM-4**		
6.	Problems & Assignment/Quiz	1	22/01/2025		**TLM-1**		
7.	Introduction, Fresnel and	1	24/01/2025		**TLM-3**		

	Fraunhoffer diffractions						
8.	Fraunhoffer diffraction due to single slit	1	25/01/2025		**TLM-2**		
9.	Double slit & N slits (Qualitative)	1	28/01/2025		**TLM-4**		
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	29/01/2025		**TLM-4**		
11.	Problems & Assignment/Quiz	1	31/01/2025		**TLM-3**		
12.	Introduction – Types of polarization	1	01/02/2025		**TLM-2**		
13.	Polarization by reflection, refraction & double refraction	1	04/02/2025		**TLM-2**		
14.	Nicol's prism	1	05/02/2025		**TLM-5**		
15.	Half wave and Quarter wave plates	1	07/02/2025		**TLM-2**		
16.	Problems & Assignment/Quiz	1	08/02/2025		**TLM-3**		
No. of classes required to complete UNIT-I: 16				No. of classes taken:			

UNIT-II: CRYSTALLOGRAPHY & X– RAY DIFFRACTION

Course Outcome :- CO 2; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	11/02/2025		**TLM-3**		
2.	Bravais Lattices	1	12/02/2025		**TLM-2**		
3.	Crystal Systems (3D)	1	14/02/2025		**TLM-2**		
4.	Coordination number – Packing fraction of –SC, BCC	1	15/02/2025		**TLM-1**		
5.	Coordination number – Packing fraction of FCC	1	18/02/2025		**TLM-1**		
6.	Miller indices & Properties	1	19/02/2025		**TL-2**		
7.	Separation between successive (hkl) planes	1	21/02/2025		**TLM-1**		

8.	Problems & Assignment /Quiz	1	22/02/2025		**TLM-3**		
9.	Bragg's law; X–ray Diffractometer	1	25/02/2025		**TLM-2**		
10.	Crystal Structure determination by Laue's method	1	28/02/2025		**TLM-5**		
11.	Crystal Structure determination by Powder method	1	04/03/2025		**TLM-5**		
12.	Problems & Assignment/Quiz	1	05/03/2025		**TLM-3**		
13.	Revision	1	07/03/2025		**TLM-2**		
14.	Revision	1	08/03/2025		**TLM-2**		
15.	MID-1 Examinations	1	11/03/2025		**----**		
16.	MID-1 Examinations	1	12/03/2025		**----**		
17.	MID-1 Examinations	1	15/03/2025		**----**		
No. of classes required to complete UNIT-II: 12				No. of classes taken:			

UNIT-III : DIELECTRIC & MAGNETIC MATERIALS

Course Outcome :- CO 3; Text Book :- T1, R2

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dielectric polarization Dielectric polarizability, Susceptibility, Dielectric constant	1	18/03/2025		**TLM-2**		
2.	Types of polarizations- Electronic polarization	1	19/03/2025		**TLM-1**		
3.	Types of polarizations - ionic & orientation polarizations (Qualitative)	1	21/03/2025		**TLM-1**		
4.	Lorentz internal field	1	22/03/2025		**TLM-2**		
5.	Claussius-Mosotti equation, Complex dielectric constant	1	25/03/2025		**TLM-1**		
6.	Frequency dependence of polarization dielectric loss	1	26/03/2025		**TLM-5**		

7.	Problems & Assignment/Quiz	1	28/03/2025		**TLM-3**		
8.	Introduction Magnetic dipole moment, Magnetization Magnetic susceptibility & permeability	1	29/03/2025		**TLM-4**		
9.	Atomic origin of magnetism	1	01/04/2025		**TLM-1**		
10.	Classification of magnetic materials-Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	02/04/2025		**TLM-2**		
11.	Domain concept for Ferromagnetism & Domain walls	1	04/04/2025		**TLM-2**		
12.	Hysteresis, soft and hard magnetic materials	1	08/04/2025		**TLM-5**		
13.	Problems & Assignment/Quiz	1	09/04/2025		**TLM-3**		
No. of classes required to complete UNIT-V: 13				No. of classes taken:			

UNIT-IV : QUANTUM MECHANICS & FREE ELECTRON THEORY

Course Outcome :- CO 4; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter, De-Broglie's Hypothesis	1	11/04/2025		**TLM-2**		Extra hour
2.	Heisenberg's Uncertainty Principle	1	12/04/2025		**TLM-2**		
3.	Significance & properties of wave function	1	15/04/2025		**TLM-2**		
4.	Schrodinger's time independent and dependent wave equations	1	16/04/2025		**TLM-1**		
5.	Particle in a one – dimensional infinite potential well	1	19/04/2025		**TLM-1**		
6.	Problems & Assignment/Quiz	1	22/04/2025		**TLM-3**		
7.	Classical free electron theory-merits and demerits	1	23/04/2025		**TLM-2**		
8.	Quantum free electron theory	1	25/04/2025		**TLM-2**		
9.	Electrical conductivity Expression	1	26/04/2025		**TLM-1**		

	based on quantum free electron theory						
10.	Fermi -Dirac distribution and temperature dependence	1	29/04/2025		**TLM-5**		
11.	Density of states & Fermi energy	1	30/04/2025		**TLM-1**		
12.	Problems & Assignment/Quiz	1	02/05/2024		**TLM-3**		
No. of classes required to complete UNIT-III: 12				No. of classes taken:			

UNIT-V : SEMICONDUCTOR PHYSICS

Course Outcome :- CO 5; Text Book :- T2, R1

S.No.	**Topics to be covered**	**No. of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign**	**Remarks**
1.	Formation of energy bands, Classification of crystalline solids	1	03/05/2024		**TLM-6**		
3.	Intrinsic semiconductors, Density of charge carriers	1	06/05/2024		**TLM-1**		
4.	Electrical conductivity, Fermi level	1	07/05/2025		**TLM-2**		
5.	Extrinsic semiconductors, Density of charge carriers	1	09/05/2024		**TLM-1**		
6.	Dependence of Fermi energy on carrier concentration & temperature	1	10/05/2024		**TLM-2**		
7.	Drift and Diffusion Currents, Einstein's equation	1	13/05/2024		**TLM-1**		
8.	Hall Effect & its applications	1	14/05/2024		**TLM-1**		
9.	Problems & Assignment/Quiz	1	16/05/2024		**TLM-4**		
10.	Revision-All units	1	17/05/2024				
11.	MID-2 Examinations	1	03/06/2025				
12.	MID-2 Examinations	1	04/06/2025		**----**		
13.	MID-2 Examinations	1	07/06/2025		**----**		
No. of classes required to complete UNIT-IV: 09				No. of classes taken:			

PART-C

EVALUATION PROCESS (R-23 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 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 ofthe 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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. N. T. Sarma	**Dr. S. Yusuf**	**Dr. S. Yusuf**	**Prof A. Rami Reddy**

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem., CSE - B
ACADEMIC YEAR : 2024-25
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : G.VIJAYA 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", 44ndEdition, 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	21-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	22-01-2025		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	24-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	25-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli’s DE	1	25-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	28-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	29-01-2025		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	31-01-2025		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	01-02-2025		TLM3	CO1	T1,T2	
10.	Non-exact DE Type II	1	01-02-2025		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	04-02-2025		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	05-02-2025		TLM1	CO1	T1,T2	
13.	Newton’s Law of cooling	1	07-02-2025		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	08-02-2025		TLM3	CO1	T1,T2	
15.	Law of natural growth and decay	1	8-02-2025		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	11-02-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	12-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	14-02-2025		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for $e^{ax\square b}$	1	15-02-2025		TLM1	CO1	T1,T2	

20.	P.I for Cos bx, or sin bx	1	15-02-2025		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	18-02-2025		TLM1	CO1	T1,T2	
22.	P.I for $e^{ax \square b}v(x)$	1	19-02-2025		TLM1	CO1	T1,T2	
23.	P.I for $x^k v(x)$	1	21-02-2025		TLM1	CO1	T1,T2	
24.	TUTORIAL-3	1	22-02-2025		TLM3	CO1	T1,T2	
25.	Method of Variation of parameters	1	22-02-2025		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	25-02-2025		TLM1	CO1	T1,T2	
27.	Simultaneous linear equations	1	28-02-2025		TLM1	CO1	T1,T2	
28.	TUTORIAL - 4	1	01-03-2025		TLM3	CO1	T1,T2	
29.	L-C-R circuits	1	01-03-2025		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	04-03-2025		TLM1	CO1	T1,T2	
31.	TUTORIAL - 5	1	05-03-2025		TLM3	CO1	T1,T2	
32.	Revision	1	07-03-2025					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	18-03-2025		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	19-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	21-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	22-03-2025		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
38.	Lagrange’s Method	1	25-03-2025		TLM1	CO2	T1,T2	
39.	Lagrange’s Method	1	26-03-2025		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	28-03-2025		TLM1	CO2	T1,T2	
41.	TUTORIAL - 6	1	29-03-2025		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	29-03-2025		TLM1	CO2	T1,T2	

43.	Homogeneous Linear PDE with constant coefficients	1	01-04-2025		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	02-04-2025		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	04-04-2025		TLM1	CO3	T1,T2	
46.	TUTORIAL - 7	1	05-04-2025		TLM3	CO3	T1,T2	
47.	Gradient	1	05-04-2025		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	08-04-2025		TLM1	CO3	T1,T2	
49.	Divergence	1	9-04-2025		TLM1	CO3	T1,T2	
50.	Curl	1	11-04-2025		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	15-04-2025		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	16-04-2025		TLM1	CO3	T1,T2	
53.	TUTORIAL - 8	1	19-04-2025		TLM3	CO3	T1,T2	
54.	Laplacian, second order operators	1	19-04-2025		TLM1	CO3	T1,T2	
55.	Vector Identities	1	22-04-2025		TLM1	CO3	T1,T2	
56.	Vector Identities	1	23-04-2025		TLM1	CO3	T1,T2	
57.	TUTORIAL - 9	1	25-04-2025		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	26-04-2025		TLM1	CO4	T1,T2	
59.	Line Integral	1	26-04-2025		TLM1	CO4	T1,T2	
60.	Circulation	1	29-04-2025		TLM1	CO4	T1,T2	
61.	Work done	1	30-04-2025		TLM1	CO4	T1,T2	
62.	Surface Integral, Flux	1	02-05-2025		TLM1	CO4	T1,T2	
63.	TUTORIAL - 10	1	03-05-2025		TLM3	CO4	T1,T2	

64.	Volume Integral	1	03-05-2025		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	06-05-2025		TLM1	CO4	T1,T2	
66.	Green's Theorem	1	07-05-2025		TLM1	CO4	T1,T2	
67.	Stoke's Thoerem	1	09-05-2025		TLM1	CO4	T1,T2	
68.	TUTORIAL - 11	1	10-05-2025		TLM3	CO4	T1,T2	
69.	Divergence Theorem	1	10-05-2025		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	13-05-2025		TLM1	CO4	T1,T2	
71.	Revision	1	14-05-2025					
72	Revision	1	16-05-2025					
No. of classes required to complete UNIT-V		15			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
73.	Non-homogeneous Linear PDE with constant coefficients	2	17-05-2025, 17-05-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

G.VIJAYA LAKSHMI	Dr. K.R. Kavitha	Dr. A. RAMI REDDY	Dr. A. RAMI REDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A **L-T-P Structure : 3-0-0**

Name of Course Instructor: Dr A.V.G.A.MARTHANDA
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
Credits: 3
Program/Branch/Sem/Sec: B.Tech/CSE II SEM B SECTION **A.Y.:** 2024-25

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	3	2	3	_	_	_	_	_	_	_	_	1
CO 2	2	2	_	_	_	_	_	_	_	_	_	_
CO 3	2	2	_	_	_	3	_	_	_	_	2	2
CO 4	3	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):

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	20-01-2025		TLM1	
2.	Ohm's Law and its limitations	1	21-01-2025		TLM1	
3.	KCL & KVL	1	23-01-2025		TLM1	
4.	series, parallel, series-parallel circuits	1	25-01-2025		TLM1	
5.	Problems	1	27-01-2025		TLM3	
6.	Super Position theorem	1	30-01-2025		TLM1	
7.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	01-02-2025		TLM2	
8.	average value, RMS value, form factor, peak factor	1	03-02-2025		TLM1	
9.	RLC Circuits	1	04-02-2025		TLM1	
10.	Impedance, Power	1	06-02-2025		TLM1	
11.	Problems	1	06-02-2025		TLM3	
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	1	8-02-2025		TLM2	
13.	Construction, principle and operation of (ii) DC Generator.		10-02-2025		TLM2	
14.	Single Phase Transformer	1	11-02-2025		TLM2	
15.	Three Phase Induction Motor	1	13-02-2025		TLM2	
16.	Alternators	1	15-02-2025		TLM2	
17.	Applications of electrical machines	1	17-02-2025		TLM2	
18.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	18-02-2025		TLM2	
19.	Moving Iron (MI) Instruments	1	20-02-2025		TLM2	
20.	Wheat Stone bridge	1	22-02-2025		TLM2	
21.	Problems	1	24-02-2025		TLM3	
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
22.	Conventional and non-conventional energy resources	1	25-02-2025		TLM2	
23.	Hydel & Nuclear power generation	1	27-02-2025		TLM2	
24.	Solar & Wind power plants	1	01-03-2025		TLM2	
25.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	03-03-2025		TLM2	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	04-03-2025		TLM2	
27.	calculation of electricity bill for domestic consumers. Working principle of Fuse and Miniature circuit breaker (MCB	1	06-03-2025		TLM2	
28.	merits and demerits. Personal safety measures: Electric ShockEarthing and its types& Safety Precaution	1	8-03-2025		TLM2	
No. of classes required to complete UNIT-III: 9				**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.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	DrA.V.G.A.MARTHANDA	Dr A.V.G.A.MARTHANDA	**Dr.G.Nageswara Rao**	**Dr.JSV prasad**
Signature				

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.K.Dilip Kumar, Professor
Mr.K.Lakshmi Prasad, Sr. Assistant Professor (A)
Ms.B.Kamala Priya, Assistant Professor (A)

Course Name & Code : Engineering Graphics – 20ME01
L-T-P Structure : 2-0-3 **Credits:** 3
Program/Sem/Sec : B.Tech/II Sem/B-Section **A.Y.:** 2024-25
PREREQUISITE : Engineering Physics, Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Identify the geometrical objects considering BIS standards. **(Remember-L1)**
CO2	Comprehend the basics of orthographic projections and deduce orthographic projections of a point and a line at different orientations. **(Understand-L2)**
CO3	Represent graphically the geometrical planes at different positions and orientations. **(Understand-L2)**
CO4	Analyze and draw solid objects at different positions and orientations. **(Apply- L3)**
CO5	Visualize isometric and orthographic views of geometrical objects and convert one form to another. **(Understand-L2)**

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

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

TEXTBOOKS:

T1	N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar publishers, 2012

REFERENCE BOOKS:

R1	Narayana K L, Kannaiah P, Textbook on Engineering Drawing, 2nd Edition, SciTech publishers.
R2	R.K.Dhawan, Engineering Drawing, S.Chand Company LTD.
R3	Venugopal, Engineering Drawing and Graphics, New Age publishers
R4	Dhananjay A. Jolhe, Engineering Drawing, Tata McGraw Hill Publishers
R5	N.S.Parthasarathy, Vela Murali, Engineering Drawing, Oxford Higher Education

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, LINES AND DIMENSIONING, CONICS, CYCLOIDS, INVOLUTES, ORTHOGRAPHIC PROJECTIONS OF POINTS

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.	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, COs, CEOs, POs and PEOs, Principles of Engineering Graphics and their significance, Drawing Instruments and their use-Conventions in Drawing, Practice, Lettering and Dimensioning – BIS conventions.	2	20-01-2025		TLM3	
2.	Geometrical Constructions, Practice	3	23-01-2025		TLM1	
3.	Engineering Curves: Conic Sections- Ellipse, Parabola, Hyperbola General methods	2	27-01-2025		TLM3	
4.	Practice	3	30-01-2025		TLM1	
5.	Introduction to Engineering Curves, conics Cycloid, Epicycloid and Practice	2	03-02-2025		TLM3	
6.	Hypocycloid; Involutes	3	06-02-2025		TLM1	
7.	**ORTHOGRAPHIC PROJECTIONS** Introduction to Orthographic Projections, First and third angle projection methods, Practice	2	10-02-2025		TLM3	
8.	Projections of Points	3	13-02-2025		TLM1	
9.	Practice	2	17-02-2025		TLM3	
No. of classes required to complete UNIT-I: 22				**No. of classes taken:**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	HOD Sign

		Required	Completion	Completion	Methods	Weekly
10.	**UNIT II: Projections of straight lines** Projections of straight lines of different orientations when line is parallel to one and inclined to the other, Practice	3	20-02-2025		TLM1, 3	
11.	Projections of lines when inclined to both the planes	2	24-02-2025		TLM1	
12.	Projections of lines when inclined to both the planes	3	27-02-2025		TLM3	
13.	**PROJECTIONS OF PLANES:** Introduction to Projection of Planes	2	03-03-2025		TLM1	
14.	Planes parallel to one of the reference planes, Practice	3	06-03-2025			
15.	Inclined to one reference plane and perpendicular to other, Practice	2	10-03-2025			
16.	Inclined to one reference plane and perpendicular to other, Practice	3	13-03-2025		TLM3	
17.	**I Mid Examinations**	**17-03-2025 to 22-03-2025**				
No. of classes required to complete UNIT-II: 18				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	**PROJECTIONS OF SOLIDS –** Introduction to Projections of Solids, Practice	2	24-03-2025		TLM1, 3	
19.	Projection of solids in simple positions, resting on HP	3	27-03-2025		TLM1, 3	
20.	Projection of solids in simple positions, resting on VP	3	03-04-2025		TLM1	
21.	Practice	2	07-04-2025		TLM3	
22.	Axis inclined to one of the reference planes and parallel to the other, Practice	3	10-04-2025		TLM1	
23.	Axis inclined to one of the reference planes and parallel to the other, Practice	3	17-04-2025		TLM3	
No. of classes required to complete UNIT-III: 16				**No. of classes taken:**		

UNIT-IV: SECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Perpendicular and inclined section planes	2	21-04-2025		TLM1, 3	
25.	Sectional views and true shape of section	3	24-04-2025		TLM1	
26.	Sections of solids in simple position	2	28-04-2025		TLM3	
27.	DEVELOPMENT OF SURFACES: Methods of development: Parallel line development	3	01-05-2025		TLM1	
28.	Radial line development	2	05-05-2025		TLM3	
29.	Development of a cube, prism, cylinder, pyramid and cone.	3	08-05-2025		TLM1	
No. of classes required to complete UNIT-IV: 15				**No. of classes taken: (including Practice)**		

UNIT-V: ISOMETRIC VIEWS: TRANSFORMATION OF PROJECTIONS FROM ORTHOGRAPHIC PROJECTIONS TO ISOMETRIC VIEW and VICE VERSA

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.	**UNIT V: ISOMETRIC VIEWS –** Introduction to Isometric Views, Practice	2	12-05-2025		TLM1, 3	
31.	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes, Practice	3	15-05-2025		TLM1	
32.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing, Practice	2	19-05-2025		TLM3	
33.	**TRANSFORMATION OF PROJECTIONS:** Introduction	3	22-05-2025		TLM1	
34.	Conversion of Orthographic Projections to Isometric Views of composite objects, Practice	2	26-05-2025		TLM1, 3	
35.	Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	3	29-05-2025		TLM1	
36.	Practice, Solids	2	02-06-2025		TLM3	

37.	Practice, Solids	3	05-06-2025		TLM3	
38.	Practice, Solids	2	09-06-2025		TLM3	
39.	Practice, Solids	3	12-06-2025		TLM3	
No. of classes required to complete UNIT-V:25				**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
I-Descriptive Examination (Units-I, II (Half of the Syllabus))	M1=15
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
Day to Day Evaluation	15
Mid Marks =80% of Max (M1,M2)+ 20% of Min ((M1, M2) + Day to Day Evaluation	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. K. DILIP KUMAR	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. M.B.S.S. Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Y. Vijay Bhaskar Reddy
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II/B **A.Y.:** 2024-25

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

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

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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											2	2	2
CO2	3	2	2	1									2	2	3
CO3	3	2	2	1									3	3	3
CO4	3	2	2	1									3	3	3
CO5	3	2	2	1									2	3	3
1 - Low				**2 –**Medium							**3 -** High				

TEXTBOOKS:

T1	Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
T2	Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1	Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
R2	C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
R3	Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
R4	Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
R5	Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	22-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	23-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	24-01-2025		TLM1	
4.	Overview of time and space complexity	1	25-01-2025		TLM1	
5.	Examples – Time Complexity, Space Complexity	2	29-01-2025 30-01-2025		TLM1	
6.	Revise Arrays-Basic Operations	1	31-01-2025		TLM1	
7.	Searching Techniques: Linear Search	1	05-02-2025		TLM1	
8.	Binary Search & Analysis	2	06-02-2025 07-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	12-02-2025		TLM1	
10.	Insertion Sort & Analysis	1	13-02-2025		TLM1	
11.	Selection Sort & Analysis	1	14-02-2205		TLM1	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	15-02-2025		TLM1	
13.	Linked List Representation	1	19-02-2025		TLM1	
14.	Sing Linked List: Operations	2	20-02-2025 21-02-2025		TLM1	
15.	Double Linked List: Operations	2	22-02-2025 27-02-2025		TLM1	
16.	Circular Single Linked List	1	28-02-2025		TLM1	
17.	Circular Double Linked List	2	05-03-2025 06-03-2025		TLM1	
18.	Comparing Arrays and Linked List	1	07-03-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	19-03-2025		TLM1	
20.	Polynomial Addition	1	20-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

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.	Introduction to Stacks: Properties	1	21-03-2025		TLM1	
22.	Operations of Stacks	1	22-03-2025		TLM1	
23.	Implementation of stacks using arrays	1	26-03-2025		TLM1	
24.	Stacks using Linked List	1	27-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	28-03-2025 29-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	02-04-2025 03-04-2025		TLM1	
27.	Checking Balanced Parenthesis	1	04-04-2025		TLM1	
28.	Reversing a List	1	10-04-2025		TLM1	
29.	Backtracking	1	11-04-2025		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	16-04-2025		TLM1	
31.	Implementing queues using arrays	1	17-04-2025		TLM1	
32.	Implementing queues using Linked List	1	19-04-2025		TLM1	
33.	Applications of Queue: Scheduling	1	23-04-2025		TLM1	
34.	Breadth First Search	1	24-04-2025		TLM1	
35.	Circular Queue	2	25-04-2025 26-04-2025		TLM1	
36.	Double ended queue	2	30-04-2025 01-05-2025		TLM1	
37.	Applications of Deque	1	02-05-2025		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	03-05-2025		TLM1	
39.	Representation of Trees	1	07-05-2025		TLM1	
40.	Tree Traversals	1	08-05-2025		TLM1	
41.	Binary Search Trees- Operations	2	09-05-2025 14-05-2025		TLM1	
42.	Hashing Introduction, Hash Functions	1	15-05-2025		TLM1	
43.	Collison Resolution Techniques: Separate Chaining	1	16-05-2025		TLM1	
44.	Open Addressing: Linear Probing, Quadratic Probing	1	17-05-2025		TLM1	
45.	Double Hashing, Rehashing	1	17-05-2025		TLM1	
No. of classes required to complete UNIT-V: 09				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression	1	01-03-2025					
2.	Towers of Hanoi	1	09-04-2025					
3.	Extendable Hashing	1	17-05-2025					
	No. of classes	3			No. of classes taken:			
II MID EXAMINATIONS (19-05-2025 TO 24-05-2024)								

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. D. Veeraiah**
Signature				

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	:	**B.Tech., I-Sem., CSE-B**
ACADEMIC YEAR	:	**2024-25**
COURSE NAME & CODE	:	**ENGINEERING PHYSICS LAB**
L-T-P STRUCTURE	:	**0 – 0 – 2**
COURSE CREDITS	:	**1**
COURSE INSTRUCTOR	:	**Dr. N. T. SARMA / Mrs. P.V.Sirisha**
COURSE COORDINATOR	:	
Pre-requisites	:	**Nil**

Course Objective: To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:
CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

Course articulation matrix (Correlation between CO's and PO's):

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's →	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO2.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

List of Experiments

1. Determination of radius of curvature of a given Plano - Convex lens by Newton's rings.
2. Determination of dielectric constant using charging and discharging method.
3. Determination of wavelength of a laser light using diffraction grating.
4. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
5. Determination of temperature coefficients of a thermistor.
6. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
7. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.
8. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
9. Sonometer- Verification of laws of a stretched string.
10. Determination of energy band gap of a semiconductor using p-n junction diode.

References:

- A Textbook of Practical Physics – S. Balasubramanian, M.N. Srinivasan, S. Chand publishers-2017.

BOS APPROVED TEXT BOOKS:

1. Lab Manual Prepared by the LBRCE.

EVALUATION PROCESS:

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): EEE-A

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
1.	Introduction & Demonstration	3	13/01/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
2.	Experiment 1	3	20/01/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
3.	Experiment 2	3	27/01/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
4.	Experiment 3	3	03/02/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
5.	Experiment 3	3	10/02/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
6.	Experiment 4	3	17/02/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
7.	Experiment 5	3	24/02/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
8.	Experiment 6	3	03/03/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
9.	**MID-1 Exam**	3	10/03/2025		**---**	---	---	
10.	Experiment 7	3	17/03/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
11.	Experiment 8	3	24/03/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
12.	Experiment 8	3	07/04/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
13.	Experiment 9	3	21/04/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
14.	Experiment 10	3	28/04/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	T1	
15.	**Internal Exam**	3	05/05/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	---	
16.	**Internal Exam**	3	12/05/2025		**TLM-4**	CO1, CO2, CO3, CO4 & CO5	---	
17.	**MID-2 Exam**	3	02/06/2025		---	---	---	
No. of classes required to complete lab		14			No. of classes taken:			

PROGRAM OUTCOMES: 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, naturalsciences, and engineering sciences.

(3). **Design/development of solutions**: Design solutions for complex engineering problems anddesign system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations. **(4)**. **Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

(5). **Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

(6). **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

(7). Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need forsustainable development.

(8). Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

(9). **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams and in multidisciplinary settings.

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

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

Course Instructor	Course Coordinator	Module Coordinator	H.O.D
Dr. N. T. SARMA	**Dr. S. Yusuf**	**Dr. S. Yusuf**	**Prof. A. Rami Reddy**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC(A) & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
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L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.G.Nageswara Rao / Dr.P.Sobharani
Course Name & Code : ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP & 23EE51
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/CSE/II SEM/B **A.Y.:** 2024-25

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

COURSE DELIVERY PLAN (LESSON PLAN): ELECTRICAL ENGINEERING

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 PRECUATIONS & Other suggestions.	3	21-01-2025		TLM4	
2.	Verification of KCL and KVL	3	28-01-2025		TLM4	
3.	Verification of Superposition theorem	3	04-02-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	11-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	18-02-2025		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	25-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	25-03-2025		TLM4	
8.	Internal Lab Examination (**Electrical**)	3	4-03-2025		TLM4	
No. of classes required: 21				**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	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.
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: 20-01-2025

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr.G.Nageswara Rao	**Dr.G.Nageswara Rao**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
Signature				

COURSE HANDOUT

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

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

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

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	LabManual

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (BATCH-B1)

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1	Demonstration	3	24/01/2025		TLM8	R1	
2	Experiment-1	3	31/01/2025		TLM8	R1	
3	Experiment-2	3	07/02/2025		TLM8	R1	
4	Experiment-3	3	14/02/2025		TLM8	R1	
5	Experiment-4	3	21/02/2025		TLM8	R1	
6	Experiment-5	3	28/02/2025		TLM8	R1	
7	Experiment-6	3	07/03/2025		TLM8	R1	
I-Mid Examinations (10.03.2025 to 15.03.2025)							
8	Experiment-7	3	21/03/2025		TLM8	R1	
9	Experiment-8	3	28/03/2025		TLM8	R1	
10	Repetition lab	3	04/04/2025		TLM8		
11	Repetition lab	3	11/04/2025		TLM6		
12	Viva voce	3	02/05/2025		TLM6		
13	Viva voce	3	09/05/2025		TLM6		
14	Lab Internal		16/05/2025				

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
Summer vacation	19-05-2025	31-05-2025	1W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical's	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: B-SEC

Batch No.	Reg.No.of Students	Number of Students
B1	24761A0566-582	17
B2	24761A0583-599	17
B3	24761A05A0-5B5	16
B4	24761A05B6-5D1	16

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

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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hodcse@lbrce.ac.in, cseoffice@lbrce.ac.in, Phone: 08659-222 933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. Y. Vijay Bhaskar Reddy
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure **: 0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/B **A.Y.:** 2024-25

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	HOD Sign
1.	Array Manipulations	3	22-01-2025		
2.	Searching and Sorting Techniques	3	29-01-2025		
3.	Single Linked List	3	05-02-2025		
4.	Double Linked List	3	12-02-2025		
5.	Circular Linked List	3	19-02-2025		
6.	Polynomial Representation & Polynomial Addition	3	05-03-2025		
7.	Linked List Applications	3	19-03-2025		
8.	Stack Implementation	3	26-03-2025		
9.	Stack Applications	3	02-04-2025		
10.	Queue Implementation & Circular Queue	3	09-04-205		
11.	Double Ended Queue	3	16-04-2025		
12.	Trees	3	23-04-2025		
13.	Hashing	3	30-04-2025		
14.	Internal Exam	3	07-05-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
Signature				

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : B. Tech., II-Sem., **CSE-C**

ACADEMIC YEAR : 2024-2025

COURSE NAME & CODE : Engineering Physics-23FE04

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Dr. S. YUSUF**

COURSE COORDINATOR : **Dr. S. YUSUF**

To bridge the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

Course Outcomes:

CO1: Analyze the intensity variation of light due to interference, diffraction and Polarization (Apply-L3).
CO2: Understand the basics of crystals and their structures (Understand-L2).
CO3: Summarize various types of polarization of dielectrics and classify the magnetic materials (Understand-L2)
CO4: Explain fundamentals of quantum mechanics and free electron theory of metals (Understand-L2).
CO5: Identify the type of semiconductor using Hall Effect (Apply-L3).

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

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**						**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
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 TEXT BOOKS:

TEXT BOOKS

1. A Text book of "Engineering Physics" M.N. Avadhanulu, P.G. Kshirsagar, TVS Arun Murthy, S. Chand & Co., 11th Edition, 2019.
2. Engineering Physics – *D.K. Bhattacharya & Poonam Tandon, Oxford press (2015)*

REFERENCES

1. Engineering Physics - B.K.Pandey & S. Chaturvedi, Cengage Learning 2021.
2. Engineering Physics - Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. Engineering Physics - Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press 2010.
4. Engineering Physics - M.R. Srinivasan, New Age international publishers (2009).

Web Resource: //www.loc.gov/rr/scitech/selected-internet/physics.html

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): CSE-C

UNIT-I : Interference and diffraction

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.	Course Outcomes INTERFERENCE: Introduction	1	20-01-2025		TLM1	CO1	T1	
2.	Principle of superposition	1	22-01-2025		TLM1	CO1	T1	
3.	Interference of light, Interference in thin films by reflection reflection & applications	1	23-01-2025		TLM2	CO1	T1	
4.	colors in thin films	1	25-01-2025		TLM1	CO1	T1	
5.	Newton's rings	1	27-01-2025		TLM1	CO1	T1	
6.	ination of wavelength active index.	1	29-01-2025		TLM1	CO1	T1	
7.	DIFFRACTION: Introduction,	1	30-01-2025		TLM1	CO1	T1	
8.	Fresnel and Fraunhoffer diffractions	1	01-02-2025		TLM2	CO1	T1	

No. of classes required to complete UNIT-I	8	No. of classes taken:

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
9.	Fraunhoffer diffraction due to single slit,	1	03-02-2025		TLM1	CO1	T1	
10.	double slit & N slits (Qualitative)	1	05-02-2025		TLM1	CO1	T1	
11.	Diffraction Grating, Dispersive power	1	06-02-2025		TLM2	CO1	T1	
12.	Resolving power of Grating(Qualitative)	1	08-02-2025		TLM1	CO1	T1	
13.	Polarization : Introduction	1	10-02-2025		TLM1	CO1	T1	
14.	Types of polarization	1	12-02-2025		TLM1	CO1	T1	
15.	Polarization by reflection	1	13-02-2025		TLM1	CO1	T1	
16.	refraction & double refraction	1	15-02-2025		TLM2	CO1	T1	
17.	Nicol's prism	1	17-02-2025		TLM1	CO1	T1	
18.	half wave and quarter wave plates	1	19-02-2025		TLM1	CO1	T1	
No. of classes required to complete UNIT-II		10			No. of classes taken:			

UNIT – II: Crystallography & X– ray Diffraction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19	Crystallography, Space lattice; Basis, Unit cell	1	20-02-2025		TLM1	CO2	T1	
20	Lattice parameters, Bravais Lattices	1	22-02-2025		TLM2	CO2	T1	
21	Crystal Systems (3D)- Coordination number, Packing fraction of -SC	1	24-02-2025		TLM1	CO2	T1	
22	BCC, FCC	1	27-02-2025		TLM1	CO2	T1	
23	ndices, separation between ive (hkl) planes.	1	01-03-2025		TLM2	CO2	T1	
24	X–ray diffraction: Bragg's law; X–ray Diffractometer,	1	03-03-2025		TLM1	CO2	T1	
25	Structure determination by vder methods.	1	05-03-2025		TLM1	CO2	T1	

26	Revision	1	06-03-2025		TLM2	CO1, CO2		
27	Revision	1	08-03-2025		TLM2	CO1, CO2,		
28	I MID	1.5	10-03-2025			CO1, CO2,		
29	I MID	1.5	11-03-2025			CO1, CO2,		
30	I MID	1.5	12-03-2025			CO1, CO2,		
31	I MID	1.5	13-03-2025			CO1, CO2,		
32	I MID	1.5	14-03-2025			CO1, CO2,		
33	I MID	1.5	15-03-2025			CO1, CO2,		

No. of classes required to complete UNIT-II	16	No. of classes taken:

UNIT – III : DIELECTRIC & MAGNETIC MATERIALS

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.	DIELECTRIC MATERIALS: Introduction	1	17-03-2025		TLM1	CO3	T1	
35.	Dielectric polarization- Dielectric polarizability, Susceptibility, Dielectric constant & Displacement Vector	1	19-03-2025		TLM2	CO3	T1	
36.	Relation between the electric vectors	1	20-03-2025		TLM1	CO3	T1	
37.	Types of polarizations- Electronic (Quantitative), ionic (Quantitative) & orientation polarizations	1	22-03-2025		TLM2	CO3	T1	

	(Qualitative)							
38.	Lorentz internal field	1	24-03-2025		TLM1	CO3	T1	
39.	Claussius-Mosotti equation	1	26-03-2025		TLM2	CO3	T1	
40.	ex dielectric constant – cy dependence of polariz tric loss.	1	27-03-2025		TLM1	CO3	T1	
41.	MAGNETIC MATERIALS : Introduction:	1	29-03-2025		TLM2	CO3	T1	
42.	Magnetic dipole moment – Magnetization- Magnetic susceptibility & permeability	1	02-04-2025		TLM2	CO3	T1	
43.	Atomic origin of magnetism	1	03-04-2025		TLM2	CO3	T1	
44.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	05-04-2025		TLM1	CO3	T1	
45.	Domain concept for Ferromagnetism & Domain walls	1	07-04-2025		TLM2	CO3	T1	
46.	Hysteresis – soft and hard magnetic materials	1	09-04-2025		TLM2	CO3	T1	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT – IV: QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
47.	QUANTUM MECHANICS: Dual nature of matter- Heisenberg's Uncertainty Principle	1	10-04-2025		TLM1	CO4	T1	
48.	significance & properties of wave function	1	12-04-2025		TLM2	CO4	T1	
49.	Schrodinger's time independent and dependent wave equations	1	14-04-2025		TLM2	CO4	T1	

50.	in a one –dimensional i l well.	1	16-04-2025		TLM1	CO4	T1	
51.	FREE ELECTRON THEORY: Classical free electron theory (Qualitative with discussion of merits and demerits)	1	17-04-2025		TLM2	CO4	T1	
52.	Quantum free electron theory	1	19-04-2025		TLM1	CO4	T1	
53.	electrical conductivity based on quantum free electron theory	1	21-04-2025		TLM2	CO4	T1	
54.	Fermi -Dirac distribution	1	23-04-2025		TLM2	CO4	T1	
55.	Density of states – Fermi energy	1	24-04-2025		TLM1	CO4	T1	
	V: SEMI CONDUCTORS							
56.	SEMI CONDUCTORS: Formation of energy bands	1	26-04-2025		TLM2	CO5	T1	
57.	classification of crystalline solids- Intrinsic semiconductors	1	28-04-2025		TLM1	CO5	T1	
58.	Density of charge carriers- Electrical conductivity- Fermi level -Extrinsic semiconductors	1	30-04-2025		TLM1	CO5	T1	
59.	Density of charge carriers	1	01-05-2025		TLM1	CO5	T1	
60.	dependence of Fermi energy on carrier concentration and temperature	1	03-05-2025		TLM1	CO5	T1	
61.	Drift and Diffusion Currents	1	05-05-2025		TLM1	CO5	T1	
62.	Einstein’s equation	1	07-05-2025		TLM2	CO5	T1	

63.	Hall effect & its applic	1	08-05-2025		TLM1	CO5	T1	
64.	Revision	1	10-05-2025		TLM1		T1	
65.	Revision	1	12-05-2025		TLM1		T1	
66.	Revision	1	14-05-2025		TLM1		T1	
67.	Revision	1	15-05-2025		TLM1		T1	
68.	Revision	1	17-05-2025		TLM1		T1	
69.	Summer vacation		19-05-2025 to 31-05-2025					
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Contents 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
70.	SEM	1	10-05-2025		TLM1		R1	
71.	Conventional energy sources	1	12-05-2025		TLM1		R1	
75	Mid II	1	02-06-2025			CO3, CO4, CO5		
76	Mid II	1	03-06-2025			CO3, CO4, CO5		
77	Mid II	1	04-06-2025			CO3, CO4, CO5		
78	Mid II	1	05-06-2025			CO3, CO4, CO5		
79	Mid II	1	06-06-2025			CO3, CO4, CO5		
80	Mid II	1	07-06-2025			CO3, CO4, CO5		
81	Preparation and Practicals	09-06-2025 to 14-06-2025						
82	Semester end examinations	16-06-2025 to 28-06-2025						

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

Part - C

EVALUATION PROCESS:

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

PEO 1: Pursue a successful career in the area of Information Technology or its allied fields.

PEO 2: Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.

PEO 3: Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.

PEO 4: Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, team work and leadership skills in their job.

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the Information Technology will have the ability to

1.Organize, Analyze and Interpret the data to extract meaningful conclusions.

2.Design, Implement and Evaluate a computer-based system to meet desired needs.

3. Develop IT application services with the help of different current engineering tools.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. S. YUSUF	Dr. S. YUSUF	Dr. S. YUSUF	Dr. A. RAMI REDDY

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem., CSE-C
ACADEMIC YEAR : 2024-25
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr. T.Radha Rani
COURSE COORDINATOR : Dr. K.R. Kavitha
PRE-REQUISITES : Basics of Vectors, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "*Thomas Calculus*", 14^{th} 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*", 5^{th} Edition, Pearson Publishers, 2018.

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	20-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	22-01-2025		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	23-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	24-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	25-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	27-01-2025		TLM1	CO1	T1,T2	
7.	Non-exact DE Type I	1	29-01-2025		TLM1	CO1	T1,T2	
8.	TUTORIAL - I	1	30-01-2025		TLM3	CO1	T1,T2	
9.	Non-exact DE Type II	1	31-02-2025		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	01-02-2025		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	03-02-2025		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	05-02-2025		TLM1	CO1	T1,T2	
13.	Law of natural growth and decay	1	06-02-2025		TLM1	CO1	T1,T2	
14.	TUTORIAL - II	1	07-02-2025		TLM3	CO1	T1,T2	
15.	Law of natural growth and decay	1	10-02-2025		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	12-02-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	13-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	14-02-2025		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	15-02-2025		TLM1	CO1	T1,T2	
20.	Finding Particular Integral, P.I for e^{ax+b}	1	17-02-2025		TLM1	CO1	T1,T2	
21.	P.I for Cos bx, or sin bx	1	19-02-2025		TLM1	CO1	T1,T2	
22.	P.I for polynomial function	1	20-02-2025		TLM1	CO1	T1,T2	
23.	TUTORIAL - III	1	21-02-2025		TLM3	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	22-02-2025		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	24-02-2025		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	27-02-2025		TLM1	CO1	T1,T2	
27.	TUTORIAL - IV	1	28-02-2025		TLM3	CO1	T1,T2	
28.	Method of Variation of parameters	1	01-03-2025		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	03-03-2025		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	05-03-2025		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	06-03-2025		TLM1	CO1	T1,T2	
32.	TUTORIAL - V	1	07-03-2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	17-03-2025		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	19-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
36.	TUTORIAL - VI	1	21-03-2025		TLM3	CO2	T1,T2	
37.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	24-03-2025		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	26-03-2025		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	27-03-2025		TLM1	CO2	T1,T2	
41.	TUTORIAL - VII	1	28-03-2025		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	29-03-2025		TLM1	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	02-04-2025		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	03-04-2025		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	04-04-2025		TLM1	CO3	T1,T2	
46.	Gradient	1	07-04-2025		TLM1	CO3	T1,T2	

47.	Directional Derivative	1	09-04-2025		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	10-04-2025		TLM1	CO3	T1,T2	
49.	Divergence	1	11-04-2025		TLM1	CO3	T1,T2	
50.	Curl	1	16-04-2025		TLM1	CO3	T1,T2	
51.	TUTORIAL VIII	1	17-04-2025		TLM3	CO3	T1,T2	
52.	Problems	1	19-04-2025		TLM1	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	21-04-2025		TLM1	CO3	T1,T2	
54.	Solenoidal fields, Irrotational fields, potential surfaces	1	23-04-2025		TLM1	CO3	T1,T2	
55.	Laplacian, second order operators	1	24-04-2025		TLM1	CO3	T1,T2	
56.	TUTORIAL IX	1	25-04-2025		TLM3	CO3	T1,T2	
57.	Vector Identities	1	26-04-2025		TLM1	CO3	T1,T2	
58.	Vector Identities	1	28-04-2025		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-IV		15			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
59.	Introduction to Unit-V	1	30-04-2025		TLM1	CO4	T1,T2	
60.	Line Integral	1	01-05-2025		TLM1	CO4	T1,T2	
61.	Circulation	1	02-05-2025		TLM1	CO4	T1,T2	
62.	Work done	1	03-05-2025		TLM1	CO4	T1,T2	
63.	Surface Integral	1	05-05-2025		TLM1	CO4	T1,T2	
64.	Surface Integral	1	07-05-2025		TLM1	CO4	T1,T2	
65.	Flux	1	08-05-2025		TLM1	CO4	T1,T2	
66.	TUTORIAL - X	1	09-05-2025		TLM3	CO4	T1,T2	
67.	Green's Theorem	1	12-05-2025		TLM1	CO4	T1,T2	
68.	Stoke's Thoerem	1	14-05-2025		TLM1	CO4	T1,T2	
69.	Divergence Theorem	1	15-05-2025		TLM1	CO4	T1,T2	
70.	TUTORIAL - XI	1	16-05-2025		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
71.	Non-homogeneous Linear PDE with constant coefficients	1	17-05-2025		TLM2	CO2	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. B. Pangedaiah
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/II/CSE-C **A.Y.:** 2024-25

PREREQUISITE: Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs): 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.

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

CO1	Extract electrical variables of AC & DC circuits using 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 systems. (Understand)
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)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3									1	3	2		2
CO2	2	2												2		3
CO3	2	2				3					2	2	2			
CO4	3	2										1	2		3	2
CO5	3	2										1	2		3	2
CO6	2	2	2										2		2	1

1 - Low **2 –**Medium **3 -** High

TEXTBOOKS:

T1	Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
T2	Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 20
T3	Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition
T4	R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
T5	R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC 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.	Introduction to subject and course outcomes	1	21-01-2025		TLM1	
2.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	24-01-2025		TLM1	
3.	Ohm's Law and its limitations	1	25-01-2025		TLM1	
4.	KCL & KVL	1	25-01-2025		TLM1	
5.	series, parallel, series-parallel circuits	1	28-01-2025		TLM1	
6.	Super Position theorem	1	31-01-2025		TLM1	
7.	**AC Circuits:** A.C. Fundamentals:	1	01-02-2025		TLM1	
8.	Equation of AC Voltage and current, waveform	1	01-02-2025		TLM1	
9.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	04-02-2025		TLM1	
10.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	07-02-2025		TLM1	
11.	Concept of Impedance, Active power, reactive power and apparent power	1	08-02-2025		TLM1	
12.	Concept of power factor (Simple Numerical problems).	1	08-02-2025		TLM1	
No. of classes required to complete UNIT-I: 12				**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
13.	**Machines:** Construction, principle and operation of DC Motor	1	11-02-2025		TLM1	
14.	Construction, principle and operation of DC Generator	1	14-02-2025		TLM1	
15.	Construction, principle and operation of Three Phase Induction Motor	1	15-02-2025		TLM1	
16.	Construction, principle and operation of Alternator	1	15-02-2025		TLM1	
17.	Applications of electrical machines	1	18-02-2025		TLM1	
18.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments	2	21-02-2025 22-02-2025		TLM1	
19.	Wheat Stone bridge.	1	22-02-2025		TLM1	
No. of classes required to complete UNIT-II: 08				**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

20.	**Energy Resources:** : Conventional and non-conventional energy resources	1	25-02-2025		TLM1	
21.	Layout and operation of various Power Generation systems: Hydel power generation	1	28-02-2025		TLM1	
22.	Layout and operation of Nuclear power generation	1	01-03-2025		TLM1	
23.	Layout and operation of Solar power generation	1	01-03-2025		TLM1	
24.	Layout and operation of Wind power generation.	1	04-03-2025		TLM1	
25.	**Electricity bill:** : Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc	1	04-03-2025		TLM1	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers	1	07-03-2025		TLM1	
27.	**Equipment Safety Measures:** Working principle of Fuse and Miniature circuit breaker(MCB), merits and demerits	1	08-03-2025		TLM1	
28.	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	08-03-2025		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	13-01-2025	08-03-2025	8W
I Mid Examinations	**10-03-2025**	**15-03-2025**	**1W**
II Phase of Instructions	17-03-2025	17-05-2025	9W
Summer Vacation	19-05-2025	31-06-2025	2W
II Mid Examinations	**02-06-2025**	**07-06-2025**	**1W**
Preparation and Practical's	09-06-2025	14-06-2025	1W
Semester End Examinations	**16-06-2025**	**28-06-2025**	**2W**

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. B. Pangedaiah**	**Dr. A.V.G.A. Marthanda**	**Dr. G. Nageswararao**	**Dr. J. Sivavara Prasad**
Signature				

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.K.Dilip Kumar, Professor
Dr.B.Sudheer Kumar, Sr. Assistant Professor (A)
Mr.S.Umamaheswara Reddy, Assistant Professor (A)

Course Name & Code : Engineering Graphics – 20ME01
L-T-P Structure : 2-0-3 **Credits:** 3
Program/Sem/Sec : B.Tech/II Sem/C-Section **A.Y.:** 2024-25
PREREQUISITE : Engineering Physics, Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Identify the geometrical objects considering BIS standards. **(Remember-L1)**
CO2	Comprehend the basics of orthographic projections and deduce orthographic projections of a point and a line at different orientations. **(Understand-L2)**
CO3	Represent graphically the geometrical planes at different positions and orientations. **(Understand-L2)**
CO4	Analyze and draw solid objects at different positions and orientations. **(Apply- L3)**
CO5	Visualize isometric and orthographic views of geometrical objects and convert one form to another. **(Understand-L2)**

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

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

TEXTBOOKS:

T1 N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar publishers, 2012

REFERENCE BOOKS:

R1 Narayana K L, Kannaiah P, Textbook on Engineering Drawing, 2nd Edition, SciTech publishers.
R2 R.K.Dhawan, Engineering Drawing, S.Chand Company LTD.
R3 Venugopal, Engineering Drawing and Graphics, New Age publishers
R4 Dhananjay A. Jolhe, Engineering Drawing, Tata McGraw Hill Publishers
R5 N.S.Parthasarathy, Vela Murali, Engineering Drawing, Oxford Higher Education

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, LINES AND DIMENSIONING, CONICS, CYCLOIDS, INVOLUTES, ORTHOGRAPHIC PROJECTIONS OF POINTS

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.	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, COs, CEOs, POs and PEOs, Principles of Engineering Graphics and their significance, Drawing Instruments and their use-Conventions in Drawing, Practice, Lettering and Dimensioning – BIS conventions.	2	21-01-2025		TLM3	
2.	Geometrical Constructions, Practice	3	24-01-2025		TLM1	
3.	Engineering Curves: Conic Sections- Ellipse, Parabola, Hyperbola General methods	2	28-01-2025		TLM3	
4.	Practice	3	31-01-2025		TLM1	
5.	Introduction to Engineering Curves, conics Cycloid, Epicycloid and Practice	2	04-02-2025		TLM3	
6.	Hypocycloid; Involutes	3	07-02-2025		TLM1	
7.	**ORTHOGRAPHIC PROJECTIONS** Introduction to Orthographic Projections, First and third angle projection methods, Practice	2	11-02-2025		TLM3	
8.	Projections of Points	3	14-02-2025		TLM1	
9.	Practice	2	18-02-2025		TLM3	
No. of classes required to complete UNIT-I: 22				**No. of classes taken:**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	HOD Sign

		Required	Completion	Completion	Methods	Weekly
10.	**UNIT II: Projections of straight lines** Projections of straight lines of different orientations when line is parallel to one and inclined to the other, Practice	3	21-02-2025		TLM1, 3	
11.	Projections of lines when inclined to both the planes	2	25-02-2025		TLM1	
12.	Projections of lines when inclined to both the planes	3	28-02-2025		TLM3	
13.	**PROJECTIONS OF PLANES:** Introduction to Projection of Planes	2	04-03-2025		TLM1	
14.	Planes parallel to one of the reference planes, Practice	3	07-03-2025		TLM3	
15.	Inclined to one reference plane and perpendicular to other, Practice	2	11-03-2025		TLM3	
16.	**I Mid Examinations**	**17-03-2025 to 22-03-2025**				
No. of classes required to complete UNIT-II: 15				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

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.	**PROJECTIONS OF SOLIDS –** Introduction to Projections of Solids, Practice	2	25-03-2025		TLM1, 3	
18.	Projection of solids in simple positions, resting on HP	3	28-03-2025		TLM1, 3	
19.	Projection of solids in simple positions, resting on VP	2	01-04-2025		TLM1	
20.	Practice	3	04-04-2025		TLM3	
21.	Axis inclined to one of the reference planes and parallel to the other, Practice	2	08-04-2025		TLM1	
22.	Axis inclined to one of the reference planes and parallel to the other, Practice	3	11-04-2025		TLM3	
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

UNIT-IV: SECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Perpendicular and inclined section planes	2	15-04-2025		TLM1, 3	
24.	Sectional views and true shape of section	2	22-04-2025		TLM1	
25.	Sections of solids in simple position	3	25-04-2025		TLM3	
26.	DEVELOPMENT OF SURFACES: Methods of development: Parallel line development	2	29-04-2025		TLM1	
27.	Radial line development	3	02-05-2025		TLM3	
28.	Development of a cube, prism, cylinder, pyramid and cone.	2	06-05-2025		TLM1	
No. of classes required to complete UNIT-IV: 14				**No. of classes taken: (including Practice)**		

UNIT-V: ISOMETRIC VIEWS: TRANSFORMATION OF PROJECTIONS FROM ORTHOGRAPHIC PROJECTIONS TO ISOMETRIC VIEW and VICE VERSA

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
29.	**UNIT V: ISOMETRIC VIEWS –** Introduction to Isometric Views, Practice	3	09-05-2025		TLM1, 3	
30.	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes, Practice	2	13-05-2025		TLM1	
31.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing, Practice	3	16-05-2025		TLM3	
32.	**TRANSFORMATION OF PROJECTIONS:** Introduction	2	20-05-2025		TLM1	
33.	Conversion of Orthographic Projections to Isometric Views of composite objects, Practice	3	23-05-2025		TLM1, 3	
34.	Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	2	27-05-2025		TLM1	
35.	Practice, Solids	3	30-05-2025		TLM3	
36.	Practice, Solids	2	03-06-2025		TLM3	

37.	Practice, Solids	2	10-06-2025		TLM3	
38.	Practice, Solids	3	13-06-2025		TLM3	
No. of classes required to complete UNIT-V:25				**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
I-Descriptive Examination (Units-I, II (Half of the Syllabus))	M1=15
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
Day to Day Evaluation	15
Mid Marks =80% of Max (M1,M2)+ 20% of Min ((M1, M2) + Day to Day Evaluation	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. K. DILIP KUMAR	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. M.B.S.S. Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SRINIVASARAO
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /C sec. **A.Y.:** 2024-25

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like lists, stacks, queues, trees, graphs, and various sorting techniques.

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

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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				-	-	-	-	-	-		2	2	2
CO2	3	2	2	1		-	-	-	-	-	-		2	2	3
CO3	3	2	2	1		-	-	-	-	-	-		3	3	3
CO4	3	2	2	1		-	-	-	-	-	-		3	3	3
CO5	3	2	2	1		-	-	-	-	-	-		2	3	3
1 - Low **2 –**Medium **3 -** High															

TEXTBOOKS:

T1	Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.
T2	Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1	Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders
R2	C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft
R3	Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum
R4	Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein
R5	Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures & Searching, sorting techniques

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 and Discussion of CO's	1	22-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	23-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	24-01-2025		TLM1	
4.	Overview of time and space complexity	1	25-01-2025		TLM1	
5.	Analysis of Liner Data structures	2	29-01-2025 30-01-2025		TLM1	
6.	Revise Arrays	1	31-01-2025		TLM1	
7.	Searching Techniques: Linear Search	1	01-02-2025		TLM1	
8.	Binary Search & Analysis	2	05-02-2025 06-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	07-02-2025		TLM1	
10.	Insertion Sort & Analysis	2	08-02-2025 12-02-2025		TLM1	
11.	Selection Sort & Analysis	2	13-02-2025 14-02-2025		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	15-02-2025		TLM1	
13.	Linked List Representation	1	19-02-2025		TLM1	
14.	Sing Linked List: Operations	2	20-02-2025 21-02-2025		TLM1	
15.	Double Linked List: Operations	2	22-02-2025 27-02-2025		TLM1	
16.	Circular Single Linked List	1	28-02-2025		TLM1	
17.	Circular Double Linked List	2	01-03-2025 05-03-2025		TLM1	
18.	Comparing Arrays and Linked List	1	06-03-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	07-03-2025		TLM1	
20.	Polynomial Addition	1	08-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

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.	Introduction to Stacks: Properties	1	19-03-2025		TLM1	
22.	Operations of Stacks	1	20-03-2025		TLM1	
23.	Implementation of stacks using arrays	1	21-03-2025		TLM1	
24.	Stacks using Linked List	1	22-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	26-03-2025 27-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	28-03-2025 29-03-2025		TLM1	
27.	Checking Balanced Parenthesis	2	04-04-2025 09-04-2025		TLM1	
28.	Reversing a List	1	10-04-2025		TLM1	
29.	Backtracking	1	11-04-2025		TLM1	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	12-04-2025		TLM1	
31.	Implementing queues using arrays	1	16-04-2025		TLM1	
32.	Implementing queues using Linked List	1	17-04-2025		TLM1	
33.	Applications of Queue: Scheduling	1	19-04-2025		TLM1	
34.	Breadth First Search	1	23-04-2025		TLM1	
35.	Circular Queue	1	24-04-2025		TLM1	
36.	Double ended queue	1	25-04-2025		TLM1	
37.	Applications of Deque	1	26-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	30-04-2025		TLM1	
39.	Representation of Trees	1	01-05-2025		TLM1	
40.	Tree Traversals	1	02-05-2025		TLM1	
41.	Binary Search Trees- Operations	2	03-05-2025 07-05-2025		TLM1	
42.	Hashing Introduction	1	08-05-2025		TLM1	
43.	Hash Functions	1	09-05-2025		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	10-05-2025		TLM1	
45.	Open Addressing: Linear Probing	1	14-05-2025		TLM1	
46.	Quadratic Probing, Double Hashing	1	15-05-2025		TLM1	
47.	Rehashing, Applications of Hashing	1	16-05-2025		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	1	17-05-2025					
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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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	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. N. SrinivasaRao**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. D. Veeraiah**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	:	B. Tech., II-Sem., CSE-C
ACADEMIC YEAR	:	2024-2025
COURSE NAME & CODE	:	ENGINEERING PHYSICS LAB & 23FE53
L-T-P STRUCTURE	:	0-0-2
COURSE CREDITS	:	1
COURSE INSTRUCTOR	:	**Dr. S. YUSUF**
COURSE COORDINATOR	:	**Dr. S. YUSUF**

Course Objectives:
To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:
CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

Course articulation matrix (Correlation between CO's and PO's):

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO2.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	1			**1**

CO4.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
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 TEXT BOOKS:

1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- CSE-C

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	3	21-01-2025		**TLM4**	1,2,3,4	T1	
2.	Demonstration	3	28-01-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
3.	Experiment 1	3	04-02-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
4.	Experiment 2	3	11-02-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
5.	Experiment 3	3	18-02-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
6.	Experiment 4	3	25-02-2025		**TLM4**	CO1, CO2, CO3, CO4	T1	
7.	Experiment 5	3	04-03-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
8.	Demonstration	3	11-03-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
9.	Experiment 6	3	18-03-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
10.	Experiment 7	3	25-03-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
11.	Experiment 8	3	01-04-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
12.	Experiment 9	3	08-04-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	

13.	Experiment 10	3	15-04-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
14.	Revision	3	22-04-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
15.	Revision	3	29-04-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
16.	**Internal Exam**	3	06-05-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
17.	**Internal Exam**	3	13-05-2025		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
No. of classes required to complete UNIT-I		51			No. of classes taken:			

EVALUATION PROCESS:

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 EDUCATIONAL OBJECTIVES (PEOs)

1.To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
2. To Function professionally in the rapidly changing world with advances in technology.
3. To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
4. To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner .

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

(2). **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

(3). **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

(4). **Conduct investigations of complex problems**: Use research-based knowledge and 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 modelling to complex engineering activities with an understanding of the limitations.

(6). **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

(7).**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

(8). **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

(9). **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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

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

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the ECE will have the ability to

(1) Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.

(2) Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools

(3) Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. S. YUSUF / Dr. P. Sobhanachalam	Dr. S. YUSUF	Dr. S. YUSUF	Dr. A. RAMI REDDY

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

DEPARTMENT OF EEE

LAB HANDOUT

PART-A

Name of Course Instructor : Dr. B. Pangedaiah, Mrs. T. Himabindu

Course Name & Code : Electrical & Electronics Engineering Workshop (E & EE WS)

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

Program/Sem **:** B.Tech. CSE- II Sem-Sec C **A.Y.** : 2024-25

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

To impart knowledge on the principles of digital electronics and fundamentals of electron devices & its applications.

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 & PSOs):

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

PART-B

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, Course Objectives and Outcomes.	3	20-01-2025		TLM4	
2.	Verification of KCL and KVL	3	27-01-2025		TLM4	
3.	Verification of Superposition theorem	3	03-02-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	10-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	17-02-2025		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	24-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises.	3	03-03-2025		TLM4	
8.	Internal Lab Examination	3	17-03-2025		TLM4	
No. of classes required: 24				**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	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.
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 a	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO b	Design and analyze electrical machines, modern drive and lighting systems
PSO c	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO d	Design controllers for electrical and electronic systems to improve their performance.

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Dr. B. Pangedaiah	Dr. A.V.G.A.Marthanda	Dr. G. Nageswararao	Dr. J. Sivavara Prasad

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, Computer Science Engineering

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr.K.Venkateswara Reddy, Asst. Professor
Mr.K.Sai Babu, Asst. Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	LabManual

COURSE DELIVERY PLAN (LESSON PLAN): Section-C

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	23-01-2025		TLM8	-	
2.	Experiment-1	3	30-01-2025		TLM8	R1	
3.	Experiment-2	3	06-02-2025		TLM8	R1	
4.	Experiment-3	3	13-02-2025		TLM8	R1	
5.	Experiment-4	3	20-02-2025		TLM8	R1	
6.	Experiment-5	3	27-02-2025		TLM8	R1	
7.	Experiment-6	3	06-03-2025		TLM8	R1	
I-Mid Examinations (10.03.2025 to 15.03.2025)							
8.	Experiment-7	3	20-03-2025		TLM8	R1	
9.	Experiment-8	3	27-03-2025		TLM8	R1	
10.	Experiment-9	3	03-04-2025		TLM8	R1	
11.	Experiment-10	3	10-04-2025		TLM8	R1	
12.	Additional Experiments	3	24-04-2025		TLM8	R1	
13.	Repetition lab	3	01-05-2025		TLM8	R1	
14.	Repetition lab	3	08-05-2025		TLM8	R1	
15.	Lab Internal	3	15-05-2025		TLM6	-	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical’s	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: D-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B11	24761A05D2-5E4	13	B21	24761A05D2-5E4	13
B12	24761A05E5-5F7	13	B22	24761A05E5-5F7	13
B13	24761A05F8-5H0	13	B23	24761A05F8-5H0	13
B14	24761A05H1-5I3	13	B24	24761A05H1-5I3	13
B15	24761A05I4-5J6	13	B25	24761A05I4-5J6	13

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

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Mr.K.Venkateswara Reddy Mr.K.Sai Babu	**Mr.S.Srinivasa Reddy**	**Mr.J.Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SRINIVASARAO
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/C sec. **A.Y.:** 2024-25

PREREQUISITE: Introduction to Programming, Computer Programming Lab

COURSE EDUCATIONAL OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like lists, stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	Delivery Method	HOD Sign
1.	Introduction & COs Discussion	3	22-01-2025		TLM4	
2.	Array Manipulations	3	29-01-2025		TLM4	
3.	Searching and Sorting Techniques	3	05-02-2025		TLM4	
4.	Single Linked List	3	12-02-2025		TLM4	
5.	Double Linked List	3	19-02-2025		TLM4	
6.	Circular Linked List	3	05-03-2025		TLM4	
7.	Polynomial Representation & Polynomial Addition	3	19-03-2025		TLM4	
8.	Linked List Applications	3	26-03-2025		TLM4	
9.	Stack Implementation	3	02-04-2025		TLM4	
10.	Stack Applications	3	09-04-2025		TLM4	
11.	Queue Implementation & Circular Queue	3	16-04-2025		TLM4	
12.	Double Ended Queue	3	23-04-2025		TLM4	
13.	Trees	3	30-04-2025		TLM4	
14.	Hashing	3	07-05-2025		TLM4	
15.	Internal Exam	3	14-05-2025		TLM4	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work + Record	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. N. SrinivasaRao	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. B. Pangedaiah

Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01

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

Program/Sem/Sec : B.Tech/II/CSE-D **A.Y.:** 2024-25

PREREQUISITE: Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs): 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.

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

CO1	Extract electrical variables of AC & DC circuits using 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 systems. (Understand)
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)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3	PSO4
CO1	3	2	3									1	3	2		2
CO2	2	2												2		3
CO3	2	2				3					2	2	2			
CO4	3	2										1	2		3	2
CO5	3	2										1	2		3	2
CO6	2	2	2										2		2	1
1 - Low				**2 –**Medium							**3 -** High					

TEXTBOOKS:

T1	Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
T2	Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 20
T3	Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition
T4	R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
T5	R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC 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.	Introduction to subject and course outcomes	1	21-01-2025		TLM1	
2.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	22-01-2025		TLM1	
3.	Ohm's Law and its limitations	1	24-01-2025		TLM1	
4.	KCL & KVL	1	24-01-2025		TLM1	
5.	series, parallel, series-parallel circuits	1	28-01-2025		TLM1	
6.	Super Position theorem	1	29-01-2025		TLM1	
7.	**AC Circuits:** A.C. Fundamentals:	1	31-01-2025		TLM1	
8.	Equation of AC Voltage and current, waveform	1	31-01-2025		TLM1	
9.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	04-02-2025		TLM1	
10.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	05-02-2025		TLM1	
11.	Concept of Impedance, Active power, reactive power and apparent power	1	07-02-2025		TLM1	
12.	Concept of power factor (Simple Numerical problems).	1	07-02-2025		TLM1	
No. of classes required to complete UNIT-I: 12				**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
13.	**Machines:** Construction, principle and operation of DC Motor	1	11-02-2025		TLM1	
14.	Construction, principle and operation of DC Generator	1	12-02-2025		TLM1	
15.	Construction, principle and operation of Three Phase Induction Motor	1	14-02-2025		TLM1	
16.	Construction, principle and operation of Alternator	1	14-02-2025		TLM1	
17.	Applications of electrical machines	1	18-02-2025		TLM1	
18.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC), Moving Iron (MI) Instruments	2	19-02-2025 21-02-2025		TLM1	
19.	Wheat Stone bridge.	1	21-02-2025		TLM1	
No. of classes required to complete UNIT-II: 08				**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

20.	**Energy Resources:** : Conventional and non-conventional energy resources	1	25-02-2025		TLM1	
21.	Layout and operation of various Power Generation systems: Hydel power generation	1	28-02-2025		TLM1	
22.	Layout and operation of Nuclear power generation	1	28-02-2025		TLM1	
23.	Layout and operation of Solar power generation	1	04-03-2025		TLM1	
24.	Layout and operation of Wind power generation.	1	04-03-2025		TLM1	
25.	**Electricity bill:** : Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc	1	05-03-2025		TLM1	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers	1	05-03-2025		TLM1	
27.	**Equipment Safety Measures:** Working principle of Fuse and Miniature circuit breaker(MCB), merits and demerits	1	07-03-2025		TLM1	
28.	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	07-03-2025		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	13-01-2025	08-03-2025	8W
I Mid Examinations	**10-03-2025**	**15-03-2025**	**1W**
II Phase of Instructions	17-03-2025	17-05-2025	9W
Summer Vacation	19-05-2025	31-06-2025	2W
II Mid Examinations	**02-06-2025**	**07-06-2025**	**1W**
Preparation and Practical's	09-06-2025	14-06-2025	1W
Semester End Examinations	**16-06-2025**	**28-06-2025**	**2W**

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. B. Pangedaiah**	**Dr. A.V.G.A. Marthanda**	**Dr. G. Nageswararao**	**Dr. J. Sivavara Prasad**
Signature				

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem., CSE - D
ACADEMIC YEAR : 2024-25
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : G.VIJAYA 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", 44ndEdition, Khanna Publishers, New Delhi, 2017.
T2 Erwin Kreyszig, "Advanced Engineering Mathematics", 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "Thomas Calculus", 14th Edition, Pearson Publishers, 2018.
R2 Dennis G. Zill and Warren S. Jones and Bartlett, "Advanced Engineering Mathematics",2018.
R3 Glyn James, "Advanced Modern Engineering Mathematics", 5th Edition, Pearson Publishers, 2018.

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	20-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	20-01-2025		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	22-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	23-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	25-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	27-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	27-01-2025		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	29-01-2025		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	30-01-2025		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	01-02-2025		TLM1	CO1	T1,T2	
11.	TUTORIAL - 1	1	03-02-2025		TLM3	CO1	T1,T2	
12.	Non-exact DE Type IV	1	03-02-2025		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	05-02-2025		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	06-02-2025		TLM1	CO1	T1,T2	
15.	Electrical circuits	1	10-02-2025		TLM1	CO1	T1,T2	
16.	TUTORIAL - 2	1	10-02-2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	12-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	13-02-2025		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for $e^{ax \square b}$	1	15-02-2025		TLM1	CO1	T1,T2	

20.	P.I for Cos bx, or sin bx	1	17-02-2025		TLM1	CO1	T1,T2	
21.	TUTORIAL - 3	1	17-02-2025		TLM3	CO1	T1,T2	
22.	P.I for polynomial function	1	19-02-2025		TLM1	CO1	T1,T2	
23.	P.I for $e^{ax\square b}v(x)$	1	20-02-2025		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	22-02-2025		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	24-02-2025		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	24-02-2025		TLM1	CO1	T1,T2	
27.	Simultaneous linear equations	1	27-02-2025		TLM1	CO1	T1,T2	
28.	L-C-R circuits	1	01-03-2025		TLM1	CO1	T1,T2	
29.	TUTORIAL - 4	1	03-03-2025		TLM3	CO1	T1,T2	
30.	Simple Harmonic motion	1	03-03-2025		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	05-03-2025		TLM1	CO1	T1,T2	
32.	Revision	1	06-03-2025					
33.	Revision		08-03-2025					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	17-03-2025		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	17-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	19-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
38.	TUTORIAL - 5	1	24-03-2025		TLM3	CO2	T1,T2	
39.	Lagrange’s Method	1	24-03-2025		TLM1	CO2	T1,T2	
40.	Lagrange’s Method	1	26-03-2025		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	27-03-2025		TLM1	CO2	T1,T2	

42.	Homogeneous Linear PDE with constant coefficients	1	29-03-2025		TLM1	CO2	T1,T2	
43.	TUTORIAL - 6	1	31-03-2025		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	31-03-2025		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	02-04-2025		TLM1	CO3	T1,T2	
46.	Gradient	1	03-04-2025		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	05-04-2025		TLM1	CO3	T1,T2	
48.	TUTORIAL - 7	1	07-04-2025		TLM3	CO3	T1,T2	
49.	Divergence	1	7-04-2025		TLM1	CO3	T1,T2	
50.	Curl	1	09-04-2025		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	10-04-2025		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	16-04-2025		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	17-04-2025		TLM1	CO3	T1,T2	
54.	Vector Identities	1	19-04-2025		TLM1	CO3	T1,T2	
55.	TUTORIAL - 8	1	21-04-2025		TLM3	CO3	T1,T2	
56.	Vector Identities	1	21-04-2025		TLM1	CO3	T1,T2	
57.	Vector Identities	1	23-04-2025		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	24-04-2025		TLM1	CO4	T1,T2	
59.	Line Integral	1	26-04-2025		TLM1	CO4	T1,T2	
60.	TUTORIAL - 8	1	28-04-2025		TLM3	CO4	T1,T2	
61.	Circulation	1	28-04-2025		TLM1	CO4	T1,T2	

62.	Work done	1	30-04-2025		TLM1	CO4	T1,T2	
63.	Surface Integral, Flux	1	01-05-2025		TLM1	CO4	T1,T2	
64.	Volume Integral	1	03-05-2025		TLM1	CO4	T1,T2	
65.	TUTORIAL - 11	1	05-05-2025		TLM3	CO4	T1,T2	
66.	Green's Theorem	1	05-05-2025		TLM1	CO4	T1,T2	
67.	Green's Theorem	1	07-05-2025		TLM1	CO4	T1,T2	
68.	Stoke's Thoerem	1	08-05-2025		TLM1	CO4	T1,T2	
69.	Divergence Theorem	1	12-05-2025		TLM1	CO4	T1,T2	
70.	TUTORIAL - 11	1	12-05-2025		TLM3	CO4	T1,T2	
71.	Divergence Theorem	1	14-05-2025					
No. of classes required to complete UNIT-V		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
72.	Non-homogeneous Linear PDE with constant coefficients	2	15-05-2025, 17-05-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

G.VIJAYA LAKSHMI	Dr. K.R. Kavitha	Dr. A. RAMI REDDY	Dr. A. RAMI REDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. GOVINDU
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /D **A.Y.:** 2024-25

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

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

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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				-	-	-	-	-	-		2	2	2
CO2	3	2	2	1		-	-	-	-	-	-		2	2	3
CO3	3	2	2	1		-	-	-	-	-	-		3	3	3
CO4	3	2	2	1		-	-	-	-	-	-		3	3	3
CO5	3	2	2	1		-	-	-	-	-	-		2	3	3
1 - Low				**2 –**Medium							**3 -** High				

TEXTBOOKS:

T1 Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.

T2 Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1 Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders

R2 C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft

R3 Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum

R4 Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

R5 Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	22-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	23-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	24-01-2025		TLM1	
4.	Overview of time and space complexity	1	25-01-2025		TLM1	
5.	Analysis of Liner Data structures	2	29-01-2025 30-01-2025		TLM1	
6.	Revise Arrays	1	31-01-2025		TLM1	
7.	Searching Techniques: Linear Search	1	01-02-2025		TLM1	
8.	Binary Search & Analysis	2	05-02-2025 06-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	07-02-2025		TLM1	
10.	Insertion Sort & Analysis	2	08-02-2025 12-02-2025		TLM1	
11.	Selection Sort & Analysis	2	13-02-2025 14-02-2025		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	15-02-2025		TLM1	
13.	Linked List Representation	1	19-02-2025		TLM1	
14.	Sing Linked List : Operations	2	20-02-2025 21-02-2025		TLM1	
15.	Double Linked List : Operations	2	22-02-2025 27-02-2025		TLM1	
16.	Circular Single Linked List	1	28-02-2025		TLM1	
17.	Circular Double Linked List	2	01-03-2025 05-03-2025		TLM1	
18.	Comparing Arrays and Linked List	1	06-03-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	07-03-2025		TLM1	
20.	Polynomial Addition	1	08-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Require d	Tentative Date of Completion	Actual Date of Completi on	Teachin g Learnin g Method s	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	19-03-2025		TLM1	
22.	Operations of Stacks	1	20-03-2025		TLM1	

23.	Implementation of stacks using arrays	1	21-03-2025		TLM1	
24.	Stacks using Linked List	1	22-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	26-03-2025 27-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	28-03-2025 29-03-2025		TLM1	
27.	Checking Balanced Parenthesis	2	04-04-2025 09-04-2025		TLM1	
28.	Reversing a List	1	10-04-2025		TLM1	
29.	Backtracking	1	11-04-2025		TLM1	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	12-04-2025		TLM1	
31.	Implementing queues using arrays	1	16-04-2025		TLM1	
32.	Implementing queues using Linked List	1	17-04-2025		TLM1	
33.	Applications of Queue : Scheduling	1	19-04-2025		TLM1	
34.	Breadth First Search	1	23-04-2025		TLM1	
35.	Circular Queue	1	24-04-2025		TLM1	
36.	Double ended queue	1	25-04-2025		TLM1	
37.	Applications of Deque	1	26-05-2025		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	30-04-2025		TLM1	
39.	Representation of Trees	1	01-05-2025		TLM1	
40.	Tree Traversals	1	02-05-2025		TLM1	
41.	Binary Search Trees-Operations	2	03-05-2025 07-05-2025		TLM1	
42.	Hashing Introduction	1	08-05-2025		TLM1	
43.	Hash Functions	1	09-05-2025		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	10-05-2025		TLM1	
45.	Open Addressing: Linear Probing	1	14-05-2025		TLM1	
46.	Quadratic Probing, Double Hashing	1	15-05-2025		TLM1	
47.	Rehashing, Applications of Hashing	1	16-05-2025		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	1	17-05-2025					
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/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 modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications andIoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. S.Govindu	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr. D.Veeraiah
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. GOVINDU

Course Name & Code : DATA STRUCTURES LAB & 23CS52

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

Program/Sem/Sec : B.Tech/CSE/II/D **A.Y.:** 2024-25

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:

The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):

CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**

CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**

CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)

CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	HOD Sign
1.	Array Manipulations	3	29-01-2025		
2.	Searching and Sorting Techniques	3	05-02-2025		
3.	Single Linked List	3	12-02-2025		
4.	Double Linked List	3	19-02-2025		
5.	Circular Linked List	3	05-03-2025		
6.	Polynomial Representation & Polynomial Addition	3	19-03-2025		
7.	Linked List Applications	3	26-03-2025		
8.	Stack Implementation	3	02-04-2025		
9.	Stack Applications	3	09-04-2025		
10.	Queue Implementation & Circular Queue	3	16-04-2025		
11.	Double Ended Queue	3	23-04-2025		
12.	Trees	3	30-04-2025		
13.	Hashing	3	07-05-2025		
14.	Internal Exam	3	14-05-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work + Record	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
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.
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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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. S.Govindu	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
Signature				

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DEPARTMENT OF EEE

LAB HANDOUT

PART-A

Name of Course Instructor : Dr. B. Pangedaiah,Dr. M. Umavani

Course Name & Code : Electrical & Electronics Engineering Workshop (E & EE WS)

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

Program/Sem **:** B.Tech. CSE- II Sem-Sec D **A.Y.** : 2024-25

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): To impart knowledge on the fundamental laws & theorems of electrical circuits, functions of electrical machines and energy calculations.

To impart knowledge on the principles of digital electronics and fundamentals of electron devices & its applications.

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 & PSOs):

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

PART-B

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, Course Objectives and Outcomes.	3	23-01-2025		TLM4	
2.	Verification of KCL and KVL	3	30-01-2025		TLM4	
3.	Verification of Superposition theorem	3	06-02-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	13-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	20-02-2025		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	27-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises.	3	06-03-2025		TLM4	
8.	Internal Lab Examination	3	20-03-2025		TLM4	
No. of classes required: 24				**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	**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.
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
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PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Dr. B. Pangedaiah	Dr. A.V.G.A.Marthanda	Dr. G. Nageswararao	Dr. J. Sivavara Prasad

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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem.,(CSE) / D
ACADEMIC YEAR : 2024-2025
COURSE NAME & CODE : ENGINEERING PHYSICS LAB
L-T-P STRUCTURE : 0-0-3
COURSE CREDITS : 1
COURSE INSTRUCTOR : **P.Vijaya Sirisha/ Dr N Aruna**
COURSE COORDINATOR : **Dr S Yusub**

Course Objectives:
To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:
CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

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

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**				**1**	1			**1**

CO2.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
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 TEXT BOOKS:
1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- AI&DS

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	3	21-01-2025		**TLM4**	
2.	Demonstration	3	28-01-2025		**TLM4**	
3.	Experiment 1		04-02-2025		**TLM4**	
4.	Experiment 2	3	11-02-2025		**TLM4**	
5.	Experiment 3	3	18-02-2025		**TLM4**	
6.	Experiment 4	3	25-02-2025		**TLM4**	
7.	Experiment 5	3	04-03-2025		**TLM4**	
8.	MID -1	3	11-03-2025		**TLM4**	
9.	Demonstration	3	18-03-2025		**TLM4**	
10.	Experiment 6	3	25-03-2025		**TLM4**	
11.	Experiment 7	3	10-04-2025		**TLM4**	
12.	Experiment 8	3	08-04-2025		**TLM4**	
13.	Experiment 9	3	15-04-2025		**TLM4**	
14.	Experiment 10	3	22-04-2025		**TLM4**	
15.	**Revision**	3	29-04-2025		**TLM4**	
16.	**Internal Exam**	3	06-05-2025			
17.	**Internal Exam**	3	13-05-2025			
	No. of classes required to complete Syllabus:			51		

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

EVALUATION PROCESS:

Evaluation Task	**Marks**
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1.To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
2. To Function professionally in the rapidly changing world with advances in technology.
3. To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
4. To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner .

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

(1). **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
(2). **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
(3). **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
(4). **Conduct investigations of complex problems**: Use research-based knowledge and 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 modelling to complex engineering activities with an understanding of the limitations.
(6). **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
(7).Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
(8). **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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(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.
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(12).Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the ECE will have the ability to
(1) Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
(2) Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools
(3) Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

P Vijaya Sirisha/ Dr N Aruna	Dr. S. Yusub	Dr. S. Yusub	Dr A. Rami Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)

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

L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	**: B.Tech., II-Sem., CSE D**
ACADEMIC YEAR	**: 2024-25**
COURSE NAME & CODE	**: ENGINEERING PHYSICS**
L-T-P STRUCTURE	**: 3-1-0**
COURSE CREDITS	**: 3**
COURSE INSTRUCTOR	**: P VIJAYA SIRISHA**
PRE-REQUISITE	**: Nil**

COURSE EDUCATIONAL OBJECTIVES (CEOs): To bring the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction, etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

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

CO 1	**Analyze** the intensity of variation of light due to interference, diffraction and polarization
CO 2	**Understand** the basics of crystals and their structures
CO 3	**Summarize** various types of polarization of dielectrics and classify the magnetic materials
CO 4	**Explain** the fundamentals of quantum mechanics and free electron theory of metals
CO5	**Identify** the type of semiconductor using Hall Effect

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

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**		**-**	**-**	**-**	**-**	**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

BOS APPROVED TEXT BOOKS:

T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2014.
T2 :M.N. Avadhanulu, P.G. Kshirsagar, "Engineering *Physics*", S. Chand &Co., 2nd Edition, 2014.

BOS APPROVED REFERENCE BOOKS:

R1: M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd Edition, 2007.
R2 :P.K. Palani Samy, "*Applied Physics*", Sci. Publ. Chennai, 4th Edition, 2016.
R3 :P. Sreenivasa Rao, K Muralidhar, "*Applied Physics*", Him. Publi. Mumbai,1st Edition, 2016.
R4 :Hitendra K Mallik , AK Singh " *Engineering Physics*", TMH, New Delhi, 1st Edition, 2009.

WEB REFERENCES AND E-TEXT BOOKS

1. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
2. http://physicsdatabase.com/free-physics-books/
3. http://www.e-booksdirectory.com
4. http://www.thphys.physics.ox.ac.uk

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-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: WAVE OPTICS

Course Outcome :- CO 1; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	20/01/2025		**TLM2**		
2.	Superposition of Coherence, Conditions for Interference	1	23/01/2025		**TLM1**		
3.	Interference from thin films	1	25/01/2025		**TLM1**		
4.	Newton's rings	1	25/01/2025		**TLM2**		
5.	Colours in thin films Applications		27/01/2025				

6.	Introduction – Diffraction, Types	1	30/01/2025		**TLM1**		
7.	Single slit diffraction	1	30/01/2025		**TLM2**		
8.	Double slit	1	01/02/2025				
9.	**N Slits**	1	01/02/2025		**TLM1**		
10.	**Diffraction grating**	1	03/02/2025		**TLM1**		
11.	TUTORIAL	1	07/02/2025		**TLM3**		
12.	Dispersive power & Resolving power of Grating	1	08/02/2025		**TLM1**		
13.	Polarization introduction	1	08/02/2025		**TLM1**		
14.	Polarization by reflection, refraction	1	10/02/2025		**TLM1**		
15.	Double refraction,	1	13/02/2025		**TLM1**		
16.	Nicol's prism	1	15/02/2025		**TLM1**		
17.	Half wave and quarter wave plate	1	15/02/2025		**TLM2**		
18.	problems	1	17/02/2025		**TLM1**		
No. of classes required to complete UNIT-I: 17				No. of classes taken:			

UNIT-II: CRYSTALLOGRAPHY AND X RAY DIFFRACTION

Course Outcome :- CO 2; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Crystallography Basic defnitions	1	20/02/2025		**TLM2**		
2.	Crystal systems	1	22/02/2025		**TLM1**		
3.	Bravais Lattices		22/02/2025		**TLM1**		
4.	Packing fraction of SC	1	24/02/2025		**TLM1**		
5.	BCC, FCC	1	27/03/2025		**TLM1**		
6.	Miller Indices, separation between (hkl) planes	1	01/03/2025		**TLM1**		
7.	Bragg's law	1	01/03/2025		**TLM2**		

8.	X-ray Diffractometer	1	03/03/2025		TLM1		
9.	Laue's method	1	06/03/2025		TLM1		
10.	powder method	1	08/03/2025		TLM1		
11.	Problems	1	08/03/2025				
12.	Mid 1	1	10/03/2025				
No. of classes required to complete UNIT-II: 09				No. of classes taken:			

UNIT-III: DIELECTRIC AND MAGNETIC MATERIALS

Course Outcome :- CO 3; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Basic Definitions Relation between electric vectors	1	17/03/2025		TLM1		
2.	Electronic polarization	1	20/03/2025		TLM1		
3.	Ionic & Orientation polarization	1	22/03/2025		TLM1		
4.	Local field,	1	22/03/2025		TLM1		
5	Clausius Mosotti equation, complex dielectric constant	1	24/03/2025		TLM2		
6	Frequency dependence of polarization Dielectric loss and problems	1	27/03/2025		TLM1		
7	Introduction to Magnetic parameters origin of magnetic moment	1	29/03/2025		TLM1		
8	Classification of magnetic materials – Dia, para & Ferro	1	29/03/2025		TLM1		
9	Classification of magnetic materials – Dia, para & Ferro Anti ferro and ferri	1	31/03/2025		TLM2		
10	Domain concept of ferromagnetismand domain walls	1	03/04/2025		TLM2		
11	Hysteresis curve	1	05/04/2025		TLM1		
12	soft and hard magnetic materials	1	05/04/2025				

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

UNIT-IV QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction quantum mechanics, DeBroglie hypothesis	1	07/04/2025		**TLM1**		
2.	Heisenberg uncertainty principle , Physical significance of wave function	1	10/04/2025		**TLM1**		
3.	Schrodinger time dependent & independent wave equations	1	12/04/2025		**TLM1**		
4.	Particle in a box	1	12/04/2025		**TLM1**		
5.	Classical free electron theory-postulates, Success & Failures	1	17/04/2025		**TLM2**		
6.	Quantum free electron theory, electrical conductivity	1	19/04/2025		**TLM1**		
7.	Tutorial	**1**	19/04/2025		**TLM3**		
8.	Fermi-Dirac distribution function-Temperature dependence	**1**	21/04/2025		**TLM2**		
9.	Density of states Fermi energy	**1**	24/04/2025		**TLM2**		
No. of classes required to complete UNIT-IV: 09				No. of classes taken:			

UNIT-V :SEMICONDUCTOR PHYSICS

Course Outcome :- CO 4; Text Book :- T2, R1

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction -	1	26/04/2025		TLM1		
2.	Classification of semiconductors	1	26/04/2025		TLM1		
3.	Density of Intrinsic and semiconductors Electrons,	1	28/05/2025		TLM1		
4.	Holes	1	01/05/2025		TLM1		
5.	Density of Intrinsic and semiconductors Holes	1	03/05/2025		TLM1		
6.	Electrical conductivity and fermi level	1	03/05/2025		TLM1		
7.	Density of Extrinsic semiconductors P-Type	1	05/05/2025		TLM1		
8.	Tutorial	1	08/05/2025		TLM2		
9.	Density of Extrinsic semiconductors N Type	1	10/05/2025		TLM1		
10.	Drift and diffusion currents Einstein equation	1	10/05/2025		TLM2		
11.	Hall effect and applications	1	12/05/2025		TLM1		
12.	Problems	1	15/05/2025		TLM1		
13.	Revision	1	17/05/2025				
14.	Revision	1	17/05/2025				
No. of classes required to complete UNIT-V: 10				No. of classes taken:			

PART-C

EVALUATION PROCESS (R-20 Regulation):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5

I-Mid Examination (Units-I, II)	M-1=18
I-Quiz Examination (Units-I, II)	Q1=07
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III , IV & V)	M-2=18
II-Quiz Examination (Units-III, IV & V)	Q2=07
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M-1,M-2)+25% of Min(M-1,M-2)	M=18
Quiz Marks =75% of Max(Q-1,Q-2)+25% of Min(Q-1,Q-2)	Q=07
Cumulative Internal Examination (CIE): A+M+Q	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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
P Vijaya Sirisha	**Dr. S. Yusub**	**Dr. S. Yusub**	**Dr. A. Rami Reddy**

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, Computer Science Engineering

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr.K.Venkateswara Reddy, Asst. Professor
Dr.S.Rami Reddy, Sr.Asst. Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	LabManual

COURSE DELIVERY PLAN (LESSON PLAN): Section-D

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	20-01-2025		TLM8	-	
2.	Experiment-1	3	27-01-2025		TLM8	R1	
3.	Experiment-2	3	03-02-2025		TLM8	R1	
4.	Experiment-3	3	10-02-2025		TLM8	R1	
5.	Experiment-4	3	17-02-2025		TLM8	R1	
6.	Experiment-5	3	24-02-2025		TLM8	R1	
7.	Experiment-6	3	03-03-2025		TLM8	R1	
I-Mid Examinations (10.03.2025 to 15.03.2025)							
8.	Experiment-7	3	17-03-2025		TLM8	R1	
9.	Experiment-8	3	24-03-2025		TLM8	R1	
10.	Experiment-9	3	07-04-2025		TLM8	R1	
11.	Experiment-10	3	21-04-2025		TLM8	R1	
12.	Additional Experiments	3	28-04-2025		TLM8	R1	
13.	Repetition lab	3	05-05-2025		TLM8	R1	
14.	Lab Internal	3	12-05-2025		TLM6	-	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical’s	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: D-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B11	24761A05J7-5L0	13	B21	24761A05J7-5L0	13
B12	24761A05L1-5M3	13	B22	24761A05L1-5M3	13
B13	24761A05M4-5N6	13	B23	24761A05M4-5N6	13
B14	24761A05N7-5O9	13	B24	24761A05N7-5O9	13
B15	24761A05P0-5Q2	13	B25	24761A05P0-5Q2	13

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

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Mr.K.Venkateswara Reddy Dr.S.Rami Reddy	**Mr.S.Srinivasa Reddy**	**Mr.J.Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	**: B.Tech., II-Sem., CSE E**
ACADEMIC YEAR	**: 2024-25**
COURSE NAME & CODE	**: ENGINEERING PHYSICS**
L-T-P STRUCTURE	**: 3-1-0**
COURSE CREDITS	**: 3**
COURSE INSTRUCTOR	**: Dr.N.Aruna**
PRE-REQUISITE	**: Nil**

COURSE EDUCATIONAL OBJECTIVES (CEOs): To bring the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction, etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

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

CO 1	**Analyze** the intensity of variation of light due to interference, diffraction and polarization
CO 2	**Understand** the basics of crystals and their structures
CO 3	**Summarize** various types of polarization of dielectrics and classify the magnetic material
CO 4	**Explain** the fundamentals of quantum mechanics and free electron theory of metals
CO5	**Identify** the type of semiconductor using Hall Effect

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

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**		**-**	**-**	**-**	**-**	**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

BOS APPROVED TEXT BOOKS:

T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2014.
T2 :M.N. Avadhanulu, P.G. Kshirsagar, "Engineering *Physics*", S. Chand &Co., 2nd Edition, 2014.

BOS APPROVED REFERENCE BOOKS:

R1: M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd Edition, 2007.
R2 :P.K. Palani Samy, "*Applied Physics*", Sci. Publ. Chennai, 4th Edition, 2016.
R3 :P. Sreenivasa Rao, K Muralidhar, "*Applied Physics*", Him. Publi. Mumbai,1st Edition, 2016.
R4 :Hitendra K Mallik , AK Singh " *Engineering Physics*", TMH, New Delhi, 1st Edition, 2009.

WEB REFERENCES AND E-TEXT BOOKS

1. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
2. http://physicsdatabase.com/free-physics-books/
3. http://www.e-booksdirectory.com
4. http://www.thphys.physics.ox.ac.uk

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-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: WAVE OPTICS

Course Outcome :- CO 1; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	20/01/2025		**TLM2**		
2.	Superposition of Coherence, Conditions for Interference	1	21/01/2025		**TLM1**		
3.	Interference from thin films	1	23/01/2025		**TLM1**		
4.	Newton's rings	1	24/01/2025		**TLM2**		
5.	Colours in thin films Applications		27/01/2025				

6.	Introduction – Diffraction, Types	1	28/01/2025		**TLM1**		
7.	Single slit diffraction	1	30/01/2025		**TLM2**		
8.	Double slit	1	01/02/2025		**TLM1**		
9.	**N Slits**						
10.	**Diffraction grating**	1	03/02/2025		**TLM1**		
11.	TUTORIAL	1	04/02/2025		**TLM3**		
12.	Dispersive power & Resolving power of Grating	1	06/02/2025		**TLM1**		
13.	Polarization introduction	1	08/02/2025		**TLM1**		
14.	Polarization by reflection, refraction	1	10/02/2025		**TLM1**		
15.	Double refraction,	1	11/02/2025		**TLM1**		
16.	Nicol's prism	1	13/02/2025		**TLM1**		
17.	Half wave and quarter wave plate	1	15/02/2025		**TLM2**		
18.	problems	1	17/02/2025		**TLM1**		
No. of classes required to complete UNIT-I: 17				No. of classes taken:			

UNIT-II: CRYSTALLOGRAPHY AND X RAY DIFFRACTION

Course Outcome :- CO 2; Text Book :- T1, R2

S.No.	**Topics to be covered**	**No. of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign**	**Remarks**
1.	Crystallography Basic defnitions	1	18/02/2025		**TLM2**		
2.	Crystal systems	1	20/02/2025		**TLM1**		
3.	Bravais Lattices		22/02/2025		**TLM1**		
4.	Packing fraction of SC	1	24/02/2025		**TLM1**		
5.	BCC, FCC	1	25/03/2025		**TLM1**		
6.	Miller Indices, separation between (hkl) planes	1	27/03/2025		**TLM1**		
7.	Bragg's law	1	01/03/2025		**TLM2**		

8.	X-ray Diffractometer	1	03/03/2025		TLM1		
9.	Laue's method	1	04/03/2025		TLM1		
10.	powder method	1	06/03/2025		TLM1		
11.	Problems	1	08/03/2025				
12.	Mid 1	1	10/03/2025				
No. of classes required to complete UNIT-II: 09				No. of classes taken:			

UNIT-III: DIELECTRIC AND MAGNETIC MATERIALS

Course Outcome :- CO 3; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Basic Definitions Relation between electric vectors	1	17/03/2025		TLM1		
2.	Electronic polarization	1	18/03/2025		TLM1		
3.	Ionic & Orientation polarization	1	20/03/2025		TLM1		
4.	Local field,	1	22/03/2025		TLM1		
5	Clausius Mosotti equation, complex dielectric constant	1	24/03/2025		TLM2		
6	Frequency dependence of polarization Dielectric loss and problems	1	25/03/2025		TLM1		
7	Introduction to Magnetic parameters origin of magnetic moment	1	27/03/2025		TLM1		
8	Classification of magnetic materials – Dia, para & Ferro	1	29/03/2025		TLM1		
9	Classification of magnetic materials – Dia, para & Ferro Anti ferro and ferri	1	01/03/2025		TLM2		
10	Domain concept of ferromagnetismand domain walls	1	03/04/2025		TLM2		
11	Hysteresis curve	1	05/04/2025		TLM1		
12	soft and hard magnetic materials	1	07/04/2025				

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

UNIT-IV QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction quantum mechanics, DeBroglie hypothesis	1	08/04/2025		**TLM1**		
2.	Heisenberg uncertainty principle , Physical significance of wave function	1	10/04/2025		**TLM1**		
3.	Schrodinger time dependent & independent wave equations	1	12/04/2025		**TLM1**		
4.	Particle in a box	1	15/04/2025		**TLM1**		
5.	Classical free electron theory-postulates, Success & Failures	1	17/04/2025		**TLM2**		
6.	Quantum free electron theory, electrical conductivity	1	19/04/2025		**TLM1**		
7.	Tutorial	**1**	19/04/2025		**TLM3**		
8.	Fermi-Dirac distribution function-Temperature dependence	**1**	21/04/2025		**TLM2**		
9.	Density of states Fermi energy	**1**	22/04/2025		**TLM2**		
No. of classes required to complete UNIT-IV: 09				No. of classes taken:			

UNIT-V :SEMICONDUCTOR PHYSICS

Course Outcome :- CO 4; Text Book :- T2, R1

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction -	1	24/04/2025		**TLM1**		
2.	Classification of semiconductors	1	26/04/2025		**TLM1**		
3.	Density of Intrinsic and semiconductors Electrons,	1	28/04/2025		**TLM1**		
4.	Holes	1	29/04/2025		**TLM1**		
5.	Density of Intrinsic and semiconductors Holes	1	01/05/2025		**TLM1**		
6.	Electrical conductivity and fermi level	1	03/05/2025		**TLM1**		
7.	Density of Extrinsic semiconductors P-Type	1	05/05/2025		**TLM1**		
8.	Tutorial	1	06/05/2025		**TLM2**		
9.	Density of Extrinsic semiconductors N Type	1	08/05/2025		**TLM1**		
10.	Drift and diffusion currents Einstein equation	1	10/05/2025		**TLM2**		
11.	Hall effect and applications	1	12/05/2025		**TLM1**		
12.	Problems	1	13/05/2025		**TLM1**		
13.	Revision	1	15/05/2025				
14.	Revision	1	17/05/2025				
No. of classes required to complete UNIT-V: 10				No. of classes taken:			

PART-C

EVALUATION PROCESS (R-20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5

I-Mid Examination (Units-I, II)	M-1=18
I-Quiz Examination (Units-I, II)	Q1=07
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III , IV & V)	M-2=18
II-Quiz Examination (Units-III, IV & V)	Q2=07
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M-1,M-2)+25% of Min(M-1,M-2)	M=18
Quiz Marks =75% of Max(Q-1,Q-2)+25% of Min(Q-1,Q-2)	Q=07
Cumulative Internal Examination (CIE): A+M+Q	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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.N.Aruna	**Dr. S. Yusub**	**Dr. S. Yusub**	**Dr. A. Rami Reddy**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING, (AUTONOMOUS)
Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE-E
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. M.Srinivasa Reddy
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	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	2	-	-	-	-	-	-	-	-	-	1
CO3	3	1	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	20-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	22-01-2025		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	22-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	23-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	25-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	27-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	29-01-2025		TLM1	CO1	T1,T2	
8.	Tutorial-1	1	29-01-2025		TLM3	CO1	T1,T2	
9.	Non-exact DE Type I	1	30-01-2025		TLM1	CO1	T1,T2	
10.	Non-exact DE Type II	1	01-02-2025		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	03-02-2025		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	05-02-2025		TLM1	CO1	T1,T2	
13.	Tutorial-2	1	05-02-2025		TLM3	CO1	T1,T2	
14.	Newton's Law of cooling	1	06-02-2025		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	08-02-2025		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	10-02-2025		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	12-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	12-02-2025		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	13-02-2025		TLM1	CO1	T1,T2	
20.	P.I for Cos bx, or sin bx	1	15-02-2025		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	17-02-2025		TLM1	CO1	T1,T2	
22.	P.I for $e^{ax+b}v(x)$	1	19-02-2025		TLM1	CO1	T1,T2	
23.	Tutorial-3	1	19-02-2025		TLM3	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	20-02-2025		TLM1	CO1	T1,T2	

25.	Method of Variation of parameters	1	22-02-2025		TLM1	CO1	T1,T2	
26.	Simultaneous linear equations	1	24-02-2025		TLM1	CO1	T1,T2	
27.	Simultaneous linear equations	1	27-02-2025		TLM1	CO1	T1,T2	
28.	L-C-R circuits	1	01-03-2025		TLM1	CO1	T1,T2	
29.	Simple Harmonic motion	1	03-03-2025		TLM1	CO1	T1,T2	
30.	Problems on SHM	1	05-03-2025		TLM1	CO1	T1,T2	
31.	Tutorial-4	1	05-03-2025		TLM3	CO1	T1,T2	
32.	Revision on Unit-1	1	06-03-2025		TLM1	CO1	T1,T2	
33.	Revision on Unit-1	1	08-03-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		17			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	17-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	19-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	19-03-2025		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	24-03-2025		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	26-03-2025		TLM1	CO2	T1,T2	
41.	Tutorial-6	1	26-03-2025		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	27-03-2025		TLM1	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	29-03-2025		TLM1	CO3	T1,T2	
44.	Vector Differentiation	1	02-04-2025		TLM1	CO3	T1,T2	
45.	Tutorial-7	1	02-04-2025		TLM3	CO3	T1,T2	
46.	Directional Derivative	1	03-04-2025		TLM1	CO3	T1,T2	

47.	Problems on Directional Derivative	1	07-04-2025		TLM1	CO3	T1,T2	
48.	Divergence	1	09-04-2025		TLM1	CO3	T1,T2	
49.	Tutorial-8	1	09-04-2025		TLM3	CO3	T1,T2	
50.	Curl	1	10-04-2025		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	12-04-2025		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	16-04-2025		TLM1	CO3	T1,T2	
53.	Tutorial-9	1	16-04-2025		TLM3	CO3	T1,T2	
54.	Vector Identities	1	17-04-2025		TLM1	CO3	T1,T2	
55.	Problems on Identities	1	19-04-2025		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
56	Introduction to Unit-V	1	21-04-2025		TLM1	CO4	T1,T2	
57.	Line Integral	1	23-04-2025		TLM1	CO4	T1,T2	
58.	Tutorial-10	1	23-04-2025		TLM3	CO4	T1,T2	
59.	Work done	1	24-04-2025		TLM1	CO4	T1,T2	
60.	Circulation	1	26-04-2025		TLM1	CO4	T1,T2	
61.	Surface Integral	1	28-04-2025		TLM1	CO4	T1,T2	
62.	Surface Integral	1	30-04-2025		TLM1	CO4	T1,T2	
63.	Volume Integral	1	30-04-2025		TLM1	CO4	T1,T2	
64.	Tutorial-11	1	01-05-2025		TLM3	CO4	T1,T2	
65.	Green's Theorem	1	03-05-2025		TLM1	CO4	T1,T2	
66.	Problems on GT	1	05-05-2025		TLM1	CO4	T1,T2	
67.	Stoke's Thoerem	1	07-05-2025		TLM1	CO4	T1,T2	
68.	Tutorial-12	1	07-05-2025		TLM3	CO4	T1,T2	
69.	Divergence Theorem	1	08-05-2025		TLM1	CO4	T1,T2	
70.	Problems on Divergence theorem	1	10-05-2025		TLM1	CO4	T1,T2	
71.	Revision on Unit-3	1	12-05-2025		TLM1	CO4	T1,T2	
72.	Revision on Unit-4	1	14-05-2025		TLM1	CO4	T1,T2	
73.	Revision on Unit-5	1	14-05-2025		TLM1	CO4	T1,T2	
74.	Revision on Unit-5	1	15-05-2025		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-V		19			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes	Tentative Date of	Actual Date of	Teaching Learning	Learning Outcome	Text Book	HOD Sign

		Required	Completion	Completion	Methods	COs	followed	Weekly
75.	Non-homogeneous Linear PDE with constant coefficients	1	17-05-2025		TLM2	CO2	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.SRIHARI
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Branch/Sem/Sec: B.Tech/CSE-E II SEM **A.Y.:** 2024-25

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	3	2	3	_	_	_	_	_	_	_	_	1
CO 2	2	2	_	_	_	_	_	_	_	_	_	_
CO 3	2	2	_	_	_	3	_	_	_	_	2	2
CO 4	3	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, 4^{th} 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	21-01-2025		TLM1	
2.	Ohm's Law and its limitations	1	24-01-2025		TLM1	
3.	KCL & KVL	1	25-01-2025		TLM1	
4.	series, parallel, series-parallel circuits	1	25-01-2025		TLM1	
5.	Problems	1	28-01-2025		TLM3	
6.	Super Position theorem	1	31-01-2025		TLM1	
7.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	01-02-2025		TLM2	
8.	average value, RMS value, form factor, peak factor	1	01-02-2025		TLM1	
9.	RLC Circuits	1	04-02-2025		TLM1	
10.	Impedance, Power	1	07-02-2025		TLM1	
11.	Problems	1	08-02-2025		TLM3	
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	1	08-02-2025		TLM2	
13.	Construction, principle and operation of (ii) DC Generator.		11-02-2025		TLM2	
14.	Single Phase Transformer	1	14-02-2025		TLM2	
15.	Three Phase Induction Motor	1	15-02-2025		TLM2	
16.	Alternators	1	15-02-2025		TLM2	
17.	Applications of electrical machines	1	18-02-2025		TLM2	
18.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	21-02-2025		TLM2	
19.	Moving Iron (MI) Instruments	1	22-02-2025		TLM2	
20.	Wheat Stone bridge	1	22-02-2025		TLM2	
21.	Problems	1	25-02-2025		TLM3	

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
22.	Conventional and non-conventional energy resources	1	28-02-2025		TLM2	
23.	Hydel & Nuclear power generation	1	01-03-2025		TLM2	
24.	Solar & Wind power plants	1	01-03-2025		TLM2	
25.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	04-03-2025		TLM2	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	04-03-2025		TLM2	
27.	calculation of electricity bill for domestic consumers.	1	07-03-2025		TLM2	
28.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	07-03-2025		TLM2	
29.	Personal safety measures: Electric Shock	1	08-03-2025		TLM2	
30.	Earthing and its types& Safety Precautions	1	08-03-2025		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
31.	Introduction	1	18-03-2025		TLM1	
32.	Evolution of electronics – Vacuum tubes to nano electronics	1	21-03-2025		TLM2	
33.	PN Junction diode	1	22-03-2025		TLM2	
34.	Characteristics of PN Junction Diode	1	22-03-2025		TLM2	
35.	Zener Effect — Zener Diode and its Characteristics	1	25-03-2025		TLM2	
36.	Bipolar Junction Transistor	1	28-03-2025		TLM2	
37.	CB Configuration	1	29-03-2025		TLM2	
38.	CE Configuration	1	29-03-2025		TLM2	
39.	CC Configuration	1	01-04-2025		TLM2	
40.	Elementary Treatment of Small Signal CE Amplifier.	1	04-04-2025		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
41.	Introduction	1	05-04-2025		TLM1	
42.	Block diagram RPS	1	05-04-2025		TLM1	
43.	working of a full wave bridge rectifier	1	08-04-2025		TLM1	
44.	capacitor filter	1	11-04-2025		TLM1	
45.	working of simple zener voltage regulator	1	12-04-2025		TLM1	
46.	Block diagram of Public Address system	1	12-04-2025		TLM1	
47.	Circuit diagram and working of RC coupled amplifier	1	15-04-2025		TLM1	

48.	Frequency response.	1	19-04-2025		TLM1	
49.	Electronic Instrumentation	1	19-04-2025		TLM1	
50.	Block diagram of an electronic instrumentation system	1	22-04-2025		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
51.	Number Systems	1	25-04-2025		TLM2	
52.	Logic gates	1	26-04-2025		TLM1	
53.	BCD & XS-3 code	1	26-04-2025		TLM2	
54.	Gray and Hamming code	1	29-04-2025		TLM1	
55.	Basic theorems & Boolean Algebra	1	02-05-2025		TLM2	
56.	Logic diagrams using logic gates only	1	03-05-2025		TLM2	
57.	Combinational Vs Sequential circuits	1	03-05-2025		TLM1	
58.	Half & Full adder	1	06-05-2025		TLM1	
59.	Introduction to sequential circuits,	1	09-05-2025		TLM1	
60.	Flip flops- SR & D	1	10-05-2025		TLM2	
61.	Flip flops- JK & T	1	10-05-2025		TLM2	
62.	Registers & counters	1	13-05-2025		TLM1	
63	**Content Beyond the Syllabus:** Op-Amp and Applications	1	16-05-2025		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.
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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.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.P.SRIHARI**	**Dr.A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.SIVA VARA PRASAD**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)

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

L.B. Reddy Nagar, Mylavaram, NTR District, Andhra Pradesh - 521230

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **Dr. P.Vijaya Kumar, Professor,**
Dr. A.Nageswara Rao,Sr. Asst.Professor,
Mr.S.Uma maheswara Reddy, Asst.Professor

Course Name & Code	: Engineering Drawing –23ME01	
L-T-P Structure	: 2-0-3	**Credits:**4
Program/Semester/Section	: B.Tech/II Sem/ CSE-E section	**A.Y.:**2024-25

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Understand the principles of engineering drawing, including engineering curves, scales, Orthographic and isometric projections. (**Understanding Level –L2**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Applying Level –L3**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Applying Level –L3**)
CO4	Draw the development of surfaces of simple objects.(**Applying Level –L3**)
CO5	Prepare isometric and orthographic sections of simple solids. (**Applying Level –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	2	-	-	-	-	-	-	-	-	3	2	1	2
CO2	3	2	1	2	-	-	-	-	-	-	-	3	1	1	2
CO3	3	2	2	-	-	-	-	-	-	-	-	3	-	1	2
CO4	3	2	2	-	-	-	-	-	-	-	-	3	2	1	2
CO5	3	2	2	-	-	-	-	-	-	-	-	3	-	-	-
1-Low				**2**–Medium					**3** -High						

TEXT BOOKS:

T1 N.D.Bhatt,EngineeringDrawing,51thRevisedandEnlargedEdition,Charotarpublishers,2012

REFERENCE BOOKS:

R1 NarayanaKL,KannaiahP,TextbookonEngineeringDrawing,2ndEdition,SciTechpublishers.
R2 R.K.Dhawan, Engineering Drawing,S.Chand Company LTD.
R3 Venugopal, Engineering Drawingand Graphics, New Age publishers
R4 Dhananjay A.Jolhe, Engineering Drawing, Tata McGraw Hill Publishers
R5 N.S.Parthasarathy,VelaMurali, Engineering Drawing, Oxford Higher Education

PART-B

COURSE DELIVERY PLAN(LESSON PLAN):

UNIT-I:INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, LINES AND DIMENSIONING, CONICS, CYCLOIDS, INVOLUTES, PROJECTION OF POINTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD sign Weekly
1	Introduction to Engineering Drawing, CEOs,COs,PEOs, and POs and PSOs	3	21-01-2025		TLM1/ TLM2	
2	Principles of Engineering Graphics and their significance, Drawing Instruments and their use-Conventions in Drawing – Practical orientation					
3	Lettering and Dimensioning–BIS Conventions-GeometricalConstructions – Theory Class	2	24-01-2025		TLM1/ TLM2	
4	Practice	3	28-01-2025		TLM4	
5	Engineering Curves: Conic Sections-Construction of ellipse, parabola and Hyperbola –Theory class	2	31-01-2025		TLM1/ TLM2	
6	Construction of Parabola, ellipse, hyperbola – General method-Practice	3	04-02-2025		TLM4	
7	Cycloids and Involutes–Theory class	2	07-02-2025		TLM1/ TLM5	
8	Construction of Cycloids and Involutes – Practice	3	11-02-2025		TLM4	
9	Orthographic Projections, First and third angle projection methods, Projections of Points, Lines inclined to one plane	2	14-02-2025		TLM1/ TLM5	
10	Practice	3	18-02-2025		TLM4	
No.of classes required to complete UNIT-I: 23 (Lecture:8 Practice:15)				**No. of classes taken:(includingPractice)**		

UNIT-II:PROJECTIONS OF STRAIGHT LINES AND PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD sign Weekly
	Projections of Straight Line parallel to both the reference planes, perpendicular to H.P and parallel to V.P, inclined to H.P and parallel to V,P and vice versa.	2	21-02-2025		TLM1/ TLM2	
	Practice	3	25-02-2025		TLM4	
11	Projection of lines- Projections of Straight Line Inclined to both the reference planes	2	28-02-2025		TLM1/ TLM2	
12	Practice	3	04-03-2025		TLM4	
13	Projectionsofplanes- Regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.	2	07-03-2025		TLM1/ TLM2	
14	Practice	3	18-03-2025		TLM4	
15	Revision	2	21-03-2025		TLM1/ TLM2	
No.of classes required to complete UNIT-II:17 (Lecture:8 Practice:9)				**No.of classes taken:(including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD sign Weekly
16	Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane – Theory and practice	3	25-03-2025		TLM4	
17	Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.	2	28-03-2025		TLM1/ TLM2	
18	Practice Session	3	01-04-2025		TLM4	
No.of classes required to complete UNIT-III:08 (Lecture:3 Practice:5)				**No. of classes taken:(includingPractice)**		

UNIT-IV:SECTIONS OF SOLIDS AND DEVELOPMENT OF SURFACES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD sign Weekly
19	Sections of Solids Solids in simple positions, Perpendicular and inclined section planes	2	04-04-2025		TLM1/ TLM2	
20	Practice Session	3	08-04-2025		TLM4	
21	Sections of solids: Sectional views and True shape of section	2	11-04-2025		TLM1/ TLM2	
22	Practice	3	15-04-2025		TLM4	
23	Development of solids Methods of Development: Parallel line development and radial line development theory	3	22-04-2025		TLM1/ TLM2	
24	Practice	3	25-04-2025		TLM4	
25	Development of solids Development of a cube, prism, cylinder, pyramid and cone.	3	29-04-2025		TLM4	
No.of classes required to complete UNIT-IV:19 (Lecture:7 Practice:12)			**No. of classes taken:(including Practice)**			

UNIT-V: CONVERSION OF ISOMETRIC VIEWS INTO ORTHOGRAPHIC VIEWS and Vice versa

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD sign Weekly
26	Introduction to Isometric Views– Theory Isometric views ,isometric axes, scale, lines& planes	2	02-05-2025		TLM1/ TLM2	
27	Practice	3	06-05-2025		TLM4	
28	Conversion of Orthographic views in to Isometric views	2	09-05-2025		TLM1/ TLM2	
29	Practice	3	13-05-2025		TLM4	
30	Conversion of Isometric views in to Orthographic views	2	16-05-2025		TLM1/ TLM2	
31	Practice	3	20-05-2025		TLM4	

32	**Content beyond the syllabus:** Scales, Planes inclined to both the planes.	2	23-05-2025		TLM1/ TLM2	
33	Revision of I, II and III Units	3	27-05-2025		TLM1	
34	Revision of IV and V Units	2	30-05-2025		TLM1/ TLM2	
No. of classes required to complete UNIT-V: 22 (Lecture:7 Practice:15)				**No.of classes taken:**		

TeachingLearningMethods			
TLM1	ChalkandTalk	**TLM4**	Demonstration(Lab/FieldVisit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	GroupDiscussion/Project

PART-C

EVALUATION PROCESS (R23 Regulation):

EvaluationTask	**Marks**
I-DescriptiveExamination(Units-I,II)	M1=15
II-DescriptiveExamination(UNIT-III,IV&V)	M2=15
DaytoDayEvaluation (Assignment)	15
MidMarks=80% of Max(M1,M2)+20%of Min((M1,M2)+DaytoDayEvaluation	M=30
CumulativeInternalExamination(CIE):M	30
SemesterEndExamination(SEE)	70
TotalMarks=CIE+SEE	100

PART-D

PROGRAMME OUTCOMES(POs):

Engineering Graduates will be able to:

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 modeling 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 theengineeringpractice.
PO9	**Individual and team work:** Function effectively as an individual, and as a member or lead er 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 engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO2	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.
PSO3	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	Course Coordinator	Head of the Department
Name of the Faculty	Dr. P.Vijaya Kumar	Mr.J.Subba Reddy	Dr.M.B.S.S Reddy
Signature			

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. NAGARJUNA REDDY
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II/E **A.Y.:** 2024-25

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques**.**

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

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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											2	2	2
CO2	3	2	2	1									2	2	3
CO3	3	2	2	1									3	3	3
CO4	3	2	2	1									3	3	3
CO5	3	2	2	1									2	3	3
1 - Low				**2 –**Medium						**3 -** High					

TEXTBOOKS:

T1 Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.

T2 Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1 Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders

R2 C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft

R3 Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum

R4 Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

R5 Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	20-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	21-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	23-01-2025		TLM1	
4.	Overview of time and space complexity	1	27-01-2025		TLM1	
5.	Examples – Time Complexity, Space Complexity	2	28-01-2025 30-01-2025		TLM1	
6.	Revise Arrays-Basic Operations	1	01-02-2025		TLM1	
7.	Searching Techniques: Linear Search	1	03-02-2025		TLM1	
8.	Binary Search & Analysis	2	04-02-2025 06-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	10-02-2025		TLM1	
10.	Insertion Sort & Analysis	1	11-02-2025		TLM1	
11.	Selection Sort & Analysis	1	13-02-2205		TLM1	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	15-02-2025		TLM1	
13.	Linked List Representation	1	17-02-2025		TLM1	
14.	Sing Linked List : Operations	2	18-02-2025 20-02-2025		TLM1	
15.	Double Linked List : Operations	2	22-02-2025 24-02-2025		TLM1	
16.	Circular Single Linked List	1	25-0202025		TLM1	
17.	Circular Double Linked List	2	27-02-2025 01-03-2025		TLM1	
18.	Comparing Arrays and Linked List	1	03-03-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	04-03-2025		TLM1	
20.	Polynomial Addition	1	06-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completio n	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	17-03-2025		TLM1	
22.	Operations of Stacks	1	18-03-2025		TLM1	
23.	Implementation of stacks using arrays	1	20-03-2025		TLM1	

24.	Stacks using Linked List	1	22-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	24-03-2025 25-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	27-03-2025 29-03-2025		TLM1	
27.	Checking Balanced Parenthesis	1	01-04-2025		TLM1	
28.	Reversing a List	1	03-04-2025		TLM1	
29.	Backtracking	1	07-04-2025		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	08-04-2025		TLM1	
31.	Implementing queues using arrays	1	10-04-2025		TLM1	
32.	Implementing queues using Linked List	1	15-04-2025		TLM1	
33.	Applications of Queue : Scheduling	1	17-04-2025		TLM1	
34.	Breadth First Search	1	19-04-2025		TLM1	
35.	Circular Queue	2	21-04-2025 22-04-2025		TLM1	
36.	Double ended queue	2	24-04-2025 26-04-2025		TLM1	
37.	Applications of Deque	1	28-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	29-04-2025		TLM1	
39.	Representation of Trees	1	01-05-2025		TLM1	
40.	Tree Traversals	1	03-05-2025		TLM1	
41.	Binary Search Trees-Operations	2	05-05-2025 07-05-2025		TLM1	
42.	Hashing Introduction,	1	09-05-2025		TLM1	
43.	Hash Functions	1	12-05-2025		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	13-05-2025		TLM1	
45.	Open Addressing: Linear Probing, Quadratic Probing	1	15-05-2025		TLM1	
46.	Double Hashing, Rehashing	1	17-05-2025		TLM1	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression	1	24-03-2025					
2.	Towers of Hanoi	1	07-04-2025					
3.	Extendable Hashing	1	17-05-2025					
	No. of classes	3			No. of classes taken:			
II MID EXAMINATIONS (19-05-2025 TO 24-05-2024)								

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr. S.Nagarjuna Reddy**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. D.Veeraiah**
Signature				

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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

COURSE HANDOUT

Part-A

PROGRAM	:	B.Tech., II-Sem.,(CSE-E)
ACADEMIC YEAR	:	2024-2025
COURSE NAME & CODE	:	ENGINEERING PHYSICS LAB
L-T-P STRUCTURE	:	0-0-3
COURSE CREDITS	:	1
COURSE INSTRUCTOR	:	**Dr N Aruna / Dr.N.T.Sarma**
COURSE COORDINATOR	:	**Dr S Yusub**

Course Objectives:
To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:
CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

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

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	3	3	2	1				1	1			1

CO2.	3	3	2	1				1	1			1
CO3.	3	3	2	1				1	1			1
CO4.	3	3	2	1				1	1			1
CO5.	3	3	2	1				1	1			1
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 TEXT BOOKS:
1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- AI&DS

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	3	24-01-2025		TLM4	
2.	Demonstration	3	31-01-2025		TLM4	
3.	Experiment 1		07-02-2025		TLM4	
4.	Experiment 2	3	14-02-2025		TLM4	
5.	Experiment 3	3	21-02-2025		TLM4	
6.	Experiment 4	3	28-02-2025		TLM4	
7.	Experiment 5	3	07-03-2025		TLM4	
8.	MID -1	3	14-03-2025		TLM4	
9.	Demonstration	3	21-03-2025		TLM4	
10.	Experiment 6	3	28-03-2025		TLM4	
11.	Experiment 7	3	04-04-2025		TLM4	
12.	Experiment 8	3	11-04-2025		TLM4	
13.	Experiment 9	3	25-04-2025		TLM4	
14.	Experiment 10	3	02-05-2025		TLM4	
15.	**Revision**	3	09-05-2025		TLM4	
16.	**Internal Exam**	3	06-05-2025			
	No. of classes required to complete Syllabus:			48		

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

EVALUATION PROCESS:

Evaluation Task	Marks
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1.To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
2. To Function professionally in the rapidly changing world with advances in technology.
3. To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
4. To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner .

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

(2). **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

(3). **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

(4). **Conduct investigations of complex problems**: Use research-based knowledge and 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 modelling to complex engineering activities with an understanding of the limitations.

(6). **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
(7).**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
(8). **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
(9). **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
(10). **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
(11). **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
(12).**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the ECE will have the ability to
(1) Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
(2) Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools
(3) Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Dr N Aruna / Dr.N.T.Sarma	Dr. S. Yusub	Dr. S. Yusub	Dr A. Rami Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.SRIHARI/ Dr.B.PANGEDAIAH
Course Name & Code : ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP & 23EE51
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/CSE-E, II SEM **A.Y.:** 2024-25

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

COURSE DELIVERY PLAN (LESSON PLAN): ELECTRICAL ENGINEERING

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 PRECUATIONS & Other suggestions.	3	22-01-2025		TLM4	
2.	Verification of KCL and KVL	3	29-01-2025		TLM4	
3.	Verification of Superposition theorem	3	04-02-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	11-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	11-02-2025		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	18-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	25-02-2025		TLM4	
8.	Internal Lab Examination (**Electrical**)	3	05-03-2025		TLM4	
No. of classes required: 21				**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	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.
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: 20-01-2025

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

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DEPARTMENT OF AEROSPACE ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, CSE-E SECTION

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Dr. L. Prabhu, Associate Professor,
Mr. S. Srinivasa Reddy, Sr. Asst. Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction	3	23-01-2025		TLM8	-	
2.	Experiment-1	3	30-01-2025		TLM8	R1	
3.	Experiment-2	3	06-02-2025		TLM8	R1	
4.	Experiment-3	3	13-02-2025		TLM8	R1	
5.	Experiment-4	3	20-02-2025		TLM8	R1	
6.	Experiment-5	3	27-02-2025		TLM8	R1	
7.	Experiment-6	3	06-03-2025		TLM8	R1	
I-Mid Examinations (10-03-2025 to 15-03-2025)							
8.	Experiment-7	3	20-03-2025		TLM8	R1	
9.	Experiment-8	3	27-03-2025		TLM8	R1	
10.	Experiment-9	3	03-04-2025		TLM8	R1	
11.	Experiment-10	3	10-04-2025		TLM8	R1	
12.	Repetition lab	3	17-04-2025		TLM8	--	
13.	Repetition lab	3	24-04-2025		TLM8	--	
14.	Repetition lab	3	01-05-2025		TLM8	--	
15.	Repetition lab	3	08-05-2025		TLM8	--	
16.	Lab Internal	3	15-05-2025		TLM6	--	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical’s	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: E-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B1	24761A05Q3 TO 24761A05R0	9	B5	24761A05T5 TO 24761A05U3	8
B2	24761A05R1 TO 24761A05R8	8	B6	24761A05U4 TO 24761A05V1	8
B3	24761A05Y5R9 TO 24761A05S6	8	B7	24761A05V2 TO 24761A05V9	8
B4	24761A05S7 TO 24761A05T4	8	B8	24761A05W0 TO 24761A05W7	8

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09
B1	F1	F2	P1	P2	C1	C2	E1	E2	T1
B2	F2	F1	P2	P1	C2	C1	E2	E1	T1
B3	P1	P2	C1	C2	E1	E2	F1	F2	T1
B4	P2	P1	C2	C1	E2	E1	F2	F1	T1
B5	C1	C2	E1	E2	F1	F2	P1	P2	T1
B6	C2	C1	E2	E1	F2	F1	P2	P1	T1
B7	E1	E2	F1	F2	P1	P2	C1	C2	T1
B8	E2	E1	F2	F1	P2	P1	C2	C1	T1

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dove Tail Joint	CO1
3.	Fitting-1(F1)-L-Joint	CO2
4.	Fitting-2(F2)-V-Joint	CO2
5.	Plumbing-1(P1)-Pipe Threading practice	CO3
6.	Plumbing-2(P2)-Pipe Layout	CO3
7.	House Wiring-1(E1)–Series and Parallel connection	CO4
8.	HouseWiring-2(E2)–Fluorescent Lamp and Calling Bell Circuit	CO4
9.	Tinsmity-1(T1)- Cone	CO2
10.	Demonstration- Welding and Foundry	CO2

NOTIFICATION OF CYCLE:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle 1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
	2.	Carpentry-2(C2)-Dove tail Joint	CO1
	3.	Fitting-1(F1)-T-Joint	CO2
	4.	Fitting-2(F2)-V-Joint	CO2
	5.	Plumbing-1(P1)-Pipe Threading practice	CO3
Cycle 2	6.	Plumbing-2(P2)-Pipe Layout	CO3
	7.	House Wiring-1(E1)–Series and Parallel Connection	CO4
	8.	House Wiring-2(E2)–Fluorescent Lamp and Calling bell Circuit	CO4
	9.	Tinsmity-1(T1)- Rectangular Tray	CO2
	10.	Demonstration- Welding and Foundry	CO2

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Dr. L. Prabhu Mr. S. Srinivasa Reddy	**Mr. S. Srinivasa Reddy**	**Mr. J. Subba Reddy**	**Dr. P. Lovaraju**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),

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

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: DR.S. NAGARJUNA REDDY
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure **: 0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/E **A.Y.:** 2024-25

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	HOD Sign
1.	Array Manipulations	3	20-01-2025		
2.	Searching and Sorting Techniques	3	27-01-2025		
3.	Single Linked List	3	03-02-2025		
4.	Double Linked List	3	10-02-2025		
5.	Circular Linked List	3	17-02-2025		
6.	Polynomial Representation & Polynomial Addition	3	24-02-2025		
7.	Linked List Applications	3	03-03-2025		
8.	Stack Implementation	3	17-03-2025		
9.	Stack Applications	3	24-03-2025		
10.	Queue Implementation & Circular Queue	3	07-04-205		
11.	Double Ended Queue	3	21-04-2025		
12.	Trees	3	28-04-2025		
13.	Hashing	3	05-05-2025		
14.	Internal Exam	3	12-05-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	**Dr. D. Veeraiah**
Signature				

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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	**: B.Tech., II-Sem., CSE -F**
ACADEMIC YEAR	**: 2024-25**
COURSE NAME & CODE	**: ENGINEERING PHYSICS**
L-T-P STRUCTURE	**: 3-1-0**
COURSE CREDITS	**: 3**
COURSE INSTRUCTOR	**: Dr.N.Aruna**
PRE-REQUISITE	**: Nil**

COURSE EDUCATIONAL OBJECTIVES (CEOs): To bring the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction, etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

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

CO 1	**Analyze** the intensity of variation of light due to interference, diffraction and polarization
CO 2	**Understand** the basics of crystals and their structures
CO 3	**Summarize** various types of polarization of dielectrics and classify the magnetic materials
CO 4	**Explain** the fundamentals of quantum mechanics and free electron theory of metals
CO5	**Identify** the type of semiconductor using Hall Effect

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

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**		**-**	**-**	**-**	**-**	**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**	**-**	**-**	**-**	**-**	**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

BOS APPROVED TEXT BOOKS:

T1 : V. Rajendran, "*Engineering Physics*", TMH, New Delhi, 6th Edition, 2014.
T2 :M.N. Avadhanulu, P.G. Kshirsagar, "Engineering *Physics*", S. Chand &Co., 2nd Edition, 2014.

BOS APPROVED REFERENCE BOOKS:

R1: M.N. Avadhanulu, TVS Arun Murthy, "Applied *Physics*", S. Chand & Co., 2nd Edition, 2007.
R2 :P.K. Palani Samy, "*Applied Physics*", Sci. Publ. Chennai, 4th Edition, 2016.
R3 :P. Sreenivasa Rao, K Muralidhar, "*Applied Physics*", Him. Publi. Mumbai,1st Edition, 2016.
R4 :Hitendra K Mallik , AK Singh " *Engineering Physics*", TMH, New Delhi, 1st Edition, 2009.

WEB REFERENCES AND E-TEXT BOOKS

1. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
2. http://physicsdatabase.com/free-physics-books/
3. http://www.e-booksdirectory.com
4. http://www.thphys.physics.ox.ac.uk

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-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: WAVE OPTICS

Course Outcome :- CO 1; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	21/01/2025		**TLM2**		
2.	Superposition of Coherence, Conditions for Interference	1	22/01/2025		**TLM1**		
3.	Interference from thin films	1	23/01/2025		**TLM1**		
4.	Newton's rings	1	25/01/2025		**TLM2**		
5.	Colours in thin films Applications		28/01/2025				

6.	Introduction – Diffraction, Types	1	29/01/2025		**TLM1**		
7.	Single slit diffraction	1	30/01/2025		**TLM2**		
8.	Double slit	1	01/02/2025				
9.	**N Slits**	1	04/02/2025		**TLM4**		
10.	**Diffraction grating**	1	05/02/2025		**TLM4**		
11.	TUTORIAL	1	06/02/2025		**TLM3**		
12.	Dispersive power & Resolving power of Grating	1	08/02/2025		**TLM3**		
13.	Polarization introduction	1	11/02/2025		**TLM1**		
14.	Polarization by reflection, refraction	1	12/02/2025		**TLM1**		
15.	Double refraction,	1	13/02/2025		**TLM1**		
16.	Nicol's prism	1	15/02/2025		**TLM1**		
17.	Half wave and quarter wave plate	1	18/02/2025		**TLM2**		
18.	problems	1	19/02/2025		**TLM1**		
No. of classes required to complete UNIT-I: 17				No. of classes taken:			

<u>UNIT-II: CRYSTALLOGRAPHY AND X RAY DIFFRACTION</u>

Course Outcome :- CO 2; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Crystallography Basic defnitions	1	20/02/2025		**TLM2**		
2.	Crystal systems	1	22/02/2025		**TLM1**		
3.	Bravais Lattices		25/02/2025		**TLM1**		
4.	Packing fraction of SC	1	27/02/2025		**TLM1**		
5.	BCC, FCC	1	01/03/2025		**TLM1**		
6.	Miller Indices, separation between (hkl) planes	1	04/03/2025		**TLM1**		
7.	Bragg's law	1	05/03/2025		**TLM2**		

8.	X-ray Diffractometer	1	06/03/2025		**TLM1**		
9.	Laue's method powder method	1	08/03/2025		**TLM1**		
10.	Mid 1	1	11/03/2025				
11.	Mid 1	1	12/03/2025				
12.	Mid 1	1	15/03/2025				
No. of classes required to complete UNIT-II: 09				No. of classes taken:			

UNIT-III: DIELECTRIC AND MAGNETIC MATERIALS

Course Outcome :- CO 3; Text Book :- T1, R2

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Basic Definitions Relation between electric vectors	1	18/03/2025		**TLM1**		
2.	Electronic polarization	1	19/03/2025		**TLM1**		
3.	Ionic & Orientation polarization	1	20/03/2025		**TLM1**		
4.	Local field,	1	22/03/2025		**TLM1**		
5	Clausius Mosotti equation, complex dielectric constant	1	25/03/2025		**TLM2**		
6	Frequency dependence of polarization Dielectric loss and problems	1	26/03/2025		**TLM1**		
7	Introduction to Magnetic parameters origin of magnetic moment	1	27/03/2025		**TLM1**		
8	Classification of magnetic materials – Dia, para & Ferro	1	29/03/2025		**TLM1**		
9	Classification of magnetic materials – Dia, para & Ferro Anti ferro and ferri	1	01/04/2025		**TLM2**		
10	Domain concept of ferromagnetismand domain walls	1	02/04/2025		**TLM2**		
11	Hysteresis curve	1	03/04/2025		**TLM1**		

12	soft and hard magnetic materials	1	08/04/2025				
No. of classes required to complete UNIT-III: 12				No. of classes taken:			

UNIT-IV QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction quantum mechanics, DeBroglie hypothesis	1	09/04/2025		**TLM1**		
2.	Heisenberg uncertainty principle , Physical significance of wave function	1	10/04/2025		**TLM1**		
3.	Schrodinger time dependent & independent wave equations	1	12/04/2025		**TLM1**		
4.	Particle in a box	1	12/04/2025		**TLM1**		
5.	Classical free electron theory-postulates, Success & Failures	1	15/04/2025		**TLM2**		
6.	Quantum free electron theory, electrical conductivity	1	16/04/2025		**TLM1**		
7.	Tutorial	**1**	17/04/2025		**TLM3**		
8.	Fermi-Dirac distribution function-Temperature dependence	**1**	19/04/2025		**TLM2**		
9.	Density of states Fermi energy	**1**	22/04/2025		**TLM2**		
No. of classes required to complete UNIT-IV: 09				No. of classes taken:			

UNIT-V :SEMICONDUCTOR PHYSICS

Course Outcome :- CO 4; Text Book :- T2, R1

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction -	1	23/04/2025		**TLM1**		
2.	Classification of semiconductors	1	24/04/2025		**TLM1**		
3.	Density of Intrinsic and semiconductors Electrons,	1	26/04/2025		**TLM1**		
4.	Holes	1	29/04/2025		**TLM1**		
5.	Density of Intrinsic and semiconductors Holes	1	30/04/2025		**TLM1**		
6.	Electrical conductivity and fermi level	1	01/05/2025		**TLM1**		
7.	Density of Extrinsic semiconductors P-Type	1	03/05/2025		**TLM1**		
8.	Tutorial	1	06/05/2025		**TLM2**		
9.	Density of Extrinsic semiconductors N Type	1	07/05/2025		**TLM1**		
10.	Drift and diffusion currents Einstein equation	1	08/05/2025		**TLM2**		
11.	Hall effect and applications	1	10/05/2025		**TLM1**		
12.	Problems	1	13/05/2025		**TLM1**		
13.	Revision	1	14/05/2025				
14.	Revision	1	15/05/2025				
15.	Revision	1	17/05/2025				
No. of classes required to complete UNIT-V: 10				No. of classes taken:			

PART-C

EVALUATION PROCESS (R-20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Unit-I)	A1=5

Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I, II)	M-1=18
I-Quiz Examination (Units-I, II)	Q1=07
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III , IV & V)	M-2=18
II-Quiz Examination (Units-III, IV & V)	Q2=07
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M-1,M-2)+25% of Min(M-1,M-2)	M=18
Quiz Marks =75% of Max(Q-1,Q-2)+25% of Min(Q-1,Q-2)	Q=07
Cumulative Internal Examination (CIE): A+M+Q	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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.N.Aruna	**Dr. S. Yusub**	**Dr. S. Yusub**	**Dr. A. Rami Reddy**

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem., CSE- F
ACADEMIC YEAR : 2024-25
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR :Dr. K. Jhansi Rani
COURSE COORDINATOR : Dr. K. R. Kavitha
PRE-REQUISITES : Basics of Vectors, Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	21-01-2025		TLM2			
2.	Course Outcomes, Program Outcomes	1	22-01-2025		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	23-01-2025		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	24-01-2025		TLM1	CO1	T1,T2	
5.	Bernoulli’s DE	1	25-01-2025		TLM1	CO1	T1,T2	
6.	Exact DE	1	28-01-2025		TLM1	CO1	T1,T2	
7.	Exact DE	1	29-01-2025		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	30-01-2025		TLM1	CO1	T1,T2	
9.	TUTORIAL - 1	1	31-01-2025		TLM3	CO1	T1,T2	
10.	Non-exact DE Type II	1	01-02-2025		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	04-02-2025		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	05-02-2025		TLM1	CO1	T1,T2	
13.	Newton’s Law of cooling	1	06-02-2025		TLM1	CO1	T1,T2	
14.	TUTORIAL - 2	1	07-02-2025		TLM3	CO1	T1,T2	
15.	Law of natural growth and decay	1	11-02-2025		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	12-02-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	13-02-2025		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	14-02-2025		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	15-02-2025		TLM1	CO1	T1,T2	
20.	P.I for Cosbx, or sinbx	1	18-02-2025		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	19-02-2025		TLM1	CO1	T1,T2	
22.	P.I for $e^{ax+b}v(x)$	1	20-02-2025		TLM1	CO1	T1,T2	
23.	TUTORIAL - 3	1	21-02-2025		TLM3	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	22-02-2025		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	25-02-2025		TLM1	CO1	T1,T2	

26.	Method of Variation of parameters	1	27-02-2025		TLM1	CO1	T1,T2	
27.	TUTORIAL - 4	1	28-02-2025		TLM3	CO1	T1,T2	
28.	Simultaneous linear equations	1	01-03-2025		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	04-03-2025		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	05-03-2025		TLM1	CO1	T1,T2	
31.	TUTORIAL - 5	1	07-03-2025		TLM3	CO1	T1,T2	
32.	Revision	1	06-03-2025					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	18-03-2025		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	19-03-2025		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	20-03-2025		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	21-03-2025		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	22-03-2025		TLM1	CO2	T1,T2	
38.	Lagrange’s Method	1	25-03-2025		TLM1	CO2	T1,T2	
39.	Lagrange’s Method	1	26-03-2025		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	27-03-2025		TLM1	CO2	T1,T2	
41.	TUTORIAL - 6	1	28-03-2025		TLM3	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	29-03-2025		TLM1	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	01-04-2025		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	02-04-2025		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	03-04-2025		TLM1	CO3	T1,T2	
46.	TUTORIAL - 7	1	04-04-2025		TLM3	CO3	T1,T2	
47.	Gradient	1	08-04-2025		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	09-04-2025		TLM1	CO3	T1,T2	

49.	Divergence	1	10-04-2025		TLM1	CO3	T1,T2	
50.	TUTORIAL - 8	1	11-04-2025		TLM3	CO3	T1,T2	
51.	Curl	1	15-04-2025		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	16-04-2025		TLM1	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	17-04-2025		TLM1	CO3	T1,T2	
54.	Laplacian, second order operators	1	19-04-2025		TLM1	CO3	T1,T2	
55.	Vector Identities	1	22-04-2025		TLM1	CO3	T1,T2	
56.	Vector Identities	1	23-04-2025		TLM1	CO3	T1,T2	
57.	TUTORIAL - 9	1	25-04-2025		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	24-04-2025		TLM1	CO4	T1,T2	
59.	Line Integral	1	26-04-2025		TLM1	CO4	T1,T2	
60.	Circulation	1	29-04-2025		TLM1	CO4	T1,T2	
61.	Work done	1	30-04-2025		TLM1	CO4	T1,T2	
62.	Surface Integral, Flux	1	01-05-2025		TLM1	CO4	T1,T2	
63.	TUTORIAL - 10	1	02-05-2025		TLM3	CO4	T1,T2	
64.	Volume Integral	1	03-05-2025		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	06-05-2025		TLM1	CO4	T1,T2	
66.	Green's Theorem	1	07-05-2025		TLM1	CO4	T1,T2	
67.	Stoke's Thoerem	1	08-05-2025		TLM1	CO4	T1,T2	
68.	TUTORIAL - 11	1	09-05-2025		TLM3	CO4	T1,T2	
69.	Divergence Theorem	1	13-05-2025		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	14-05-2025		TLM1	CO4	T1,T2	
71.	Revision	1	15-05-2025					
No. of classes required to complete UNIT-V		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
72.	Non-homogeneous Linear PDE with constant coefficients	2	17-05-2025, 16-05-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.SRIHARI
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Branch/Sem/Sec: B.Tech/CSE-F II SEM **A.Y.:** 2024-25

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	3	2	3	_	_	_	_	_	_	_	_	1
CO 2	2	2	_	_	_	_	_	_	_	_	_	_
CO 3	2	2	_	_	_	3	_	_	_	_	2	2
CO 4	3	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):

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	20-01-2025		TLM1	
2.	Ohm's Law and its limitations	1	20-01-2025		TLM1	
3.	KCL & KVL	1	23-01-2025		TLM1	
4.	series, parallel, series-parallel circuits	1	24-01-2025		TLM1	
5.	Problems	1	27-01-2025		TLM3	
6.	Super Position theorem	1	27-01-2025		TLM1	
7.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	30-01-2025		TLM2	
8.	average value, RMS value, form factor, peak factor	1	31-01-2025		TLM1	
9.	RLC Circuits	1	03-02-2025		TLM1	
10.	Impedance, Power	1	03-02-2025		TLM1	
11.	Problems	1	06-02-2025		TLM3	
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	1	07-02-2025		TLM2	
13.	Construction, principle and operation of (ii) DC Generator.	1	10-02-2025		TLM2	
14.	Single Phase Transformer	1	10-02-2025		TLM2	
15.	Three Phase Induction Motor	1	13-02-2025		TLM2	
16.	Alternators	1	14-02-2025		TLM2	
17.	Applications of electrical machines	1	17-02-2025		TLM2	
18.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	17-02-2025		TLM2	
19.	Moving Iron (MI) Instruments	1	20-02-2025		TLM2	
20.	Wheat Stone bridge	1	21-02-2025		TLM2	
21.	Problems	1	24-02-2025		TLM3	

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
22.	Conventional and non-conventional energy resources	1	24-02-2025		TLM2	
23.	Hydel & Nuclear power generation	1	27-02-2025		TLM2	
24.	Solar & Wind power plants	1	28-02-2025		TLM2	
25.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	03-03-2025		TLM2	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	03-03-2025		TLM2	
27.	calculation of electricity bill for domestic consumers.	1	06-03-2025		TLM2	
28.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	06-03-2025		TLM2	
29.	Personal safety measures: Electric Shock	1	07-03-2025		TLM2	
30.	Earthing and its types& Safety Precautions	1	07-03-2025		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
31.	Introduction	1	17-03-2025		TLM1	
32.	Evolution of electronics – Vacuum tubes to nano electronics	1	17-03-2025		TLM2	
33.	PN Junction diode	1	20-03-2025		TLM2	
34.	Characteristics of PN Junction Diode	1	21-03-2025		TLM2	
35.	Zener Effect — Zener Diode and its Characteristics	1	24-03-2025		TLM2	
36.	Bipolar Junction Transistor	1	24-03-2025		TLM2	
37.	CB Configuration	1	27-03-2025		TLM2	
38.	CE Configuration	1	28-03-2025		TLM2	
39.	CC Configuration	1	31-03-2025		TLM2	
40.	Elementary Treatment of Small Signal CE Amplifier.	1	31-03-2025		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
41.	Introduction	1	03-04-2025		TLM1	
42.	Block diagram RPS	1	04-04-2025		TLM1	
43.	working of a full wave bridge rectifier	1	07-04-2025		TLM1	
44.	capacitor filter	1	07-04-2025		TLM1	
45.	working of simple zener voltage regulator	1	10-04-2025		TLM1	
46.	Block diagram of Public Address system	1	17-04-2025		TLM1	
47.	Circuit diagram and working of RC coupled amplifier	1	21-04-2025		TLM1	

48.	Frequency response.	1	21-04-2025		TLM1	
49.	Electronic Instrumentation	1	24-04-2025		TLM1	
50.	Block diagram of an electronic instrumentation system	1	25-04-2025		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
51.	Number Systems	1	28-04-2025		TLM2	
52.	Logic gates	1	01-05-2025		TLM1	
53.	BCD & XS-3 code	1	02-05-2025		TLM2	
54.	Gray and Hamming code	1	05-05-2025		TLM1	
55.	Basic theorems & Boolean Algebra	1	05-05-2025		TLM2	
56.	Logic diagrams using logic gates only	1	8-05-2025		TLM2	
57.	Combinational Vs Sequential circuits	1	09-05-2025		TLM1	
58.	Half & Full adder	1	12-05-2025		TLM1	
59.	Introduction to sequential circuits, Registers & counters	1	12-05-2025		TLM1	
60.	Flip flops- SR & D, Flip flops- JK & T	1	15-05-2025		TLM2	
61.	**Content Beyond the Syllabus:** Op-Amp and Applications	1	16-05-2025		TLM2	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II, 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	**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.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr.P.SRIHARI**	**Dr.A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.SIVA VARA PRASAD**
Signature				

COURSE HANDOUT

PART-A

Name of Course Instructor: **Dr. V. Dhana Raju, Associate Professor,**

Course Name & Code : Engineering Graphics – 23ME01
L-T-P Structure : 1-0-4 **Credits:** 3
Program/Sem/Sec : B.Tech/I Sem/ CSE-F Section **A.Y.:** 2024-25
PREREQUISITE : Engineering Physics, Mathematics

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. (**Understand**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Apply**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Apply**)
CO4	Able to draw the development of surfaces of simple objects (**Apply**)
CO5	Prepare isometric and orthographic sections of simple solids. (**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	3	3	3	2	3							3		1	3
CO2	3	3	1	2	1							3		1	3
CO3	3	3	3	2	1							3		1	3
CO4	3	2	3	2	3							3		1	3
CO5	2	3	3	2	1							3		1	3
1 - Low				**2 –**Medium							**3 -** High				

Textbook:
1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

Reference Books:
1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc,2009.
3. Engineering Drawing with an Introduction to AutoCAD, DhananjayJolhe, Tata McGraw Hill, 2017.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, SCALES, CURVES, ORTHOGRAPHIC PROJECTIONS

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.	**UNIT I: INTRODUCTION:** Introduction to Engineering Graphics, CEOs, COs, PEOs & POs	1	20-01-2025		TLM2	
2.	Engineering Graphicsand their significance, Drawing Instruments and their use, **Scales:** Plain scales, diagonal scales and vernier scales.	2	20-01-2025		TLM1/ TLM2	
3.	**Curves:** Construction of ellipse, parabola and hyperbola by general method	2	23-01-2025		TLM1	
4.	Construction of parabola and hyperbola by general method, practice	3	27-01-2025		TLM3	
5.	Cycloid, Epicycloid, Hypocycloid	2	30-01-205		TLM1	
6.	Practice, Involutes	3	03-02-2025		TLM3	
7.	**Orthographic Projections**: Reference plane	2	06-02-2025		TLM1	
8.	Projections of a point situated in any one of the four quadrants.	3	10-02-2025		TLM3	
9.	Projections of a point, practice	2	13-02-2025		TLM1	
No. of classes required to complete UNIT-I: 20 (Lecture:8, Practice: 12)				**No. of classes taken: (including Practice)**		

UNIT-II: PROJECTIONS OF STRAIGHT LINES & PROJECTIONS OF PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10	Introduction to Projections, First and third angle projection methods Projections of straight lines parallel to both reference planes	3	17-02-2025		TLM1	
11.	Projections of straight lines perpendicular to one reference plane and parallel to other reference plane	2	20-02-2025		TLM1	
12.	Projections of straight lines inclined to one reference plane and parallel to the other reference plane, practice	3	24-02-2025		TLM1	
13.	Projections of straight lines inclined to one reference plane and parallel to the other reference plane	2	27-02-2025		TLM3	
14.	**Projections of Planes:** Regular planes Perpendicular to both reference planes	3	03-03-2025		TLM1	

15.	parallel to one reference plane and inclined to the other reference plane; Plane inclined to both the reference planes	2	06-03-2025		TLM3	
No. of classes required to complete UNIT-II: 15 (Lecture:06 Practice:09)				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

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.	**UNIT III: PROJECTIONS OF SOLIDS:** Introduction, Types of solids: Polyhedra and Solids of revolution	3	17-03-2025		TLM1	
17	Projections of solids in simple positions: Axis perpendicular to horizontal plane	2	20-03-2025		TLM3	
18.	Axis perpendicular to vertical plane and Axis parallel to both the reference planes	3	24-03-2025		TLM3	
19.	Projection of Solids with axis inclined to one reference plane and parallel to another plane	2	27-03-2025		TLM1	
No. of classes required to complete UNIT-III: 10 (Lecture: 04 Practice: 06)				**No. of classes taken: (including Practice)**		

UNIT-IV: SECTIONS OF SOLIDS & DEVELOPMENT OF SURFACES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	ActualDate of Completion	Teaching Learning Methods	HOD Sign Weekly
20	Perpendicular and inclined section planes	3	31-03-2025		TLM1	
21	Practice	2	03-04-2025		TLM3	
22	Sectional views and True shape of section	3	07-04-2025		TLM1	
23	Sections of solids in simple position only	2	10-04-2025		TLM1	
24	Practice	3	14-04-2025		TLM3	
25	**Development of Surfaces:** Methods of Development, Parallel line development and radial line development	2	17-02-2025		TLM2	
26	Development of a cube, prism, cylinder ,	3	21-04-2025		TLM3	
27	Development of a pyramid and cone	2	24-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 20 (Lecture:08 Practice: 12)				**No. of classes taken: (including Practice)**		

UNIT-V: CONVERSION OF VIEWS & COMPUTER GRAPHICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Introduction to isometric & orthographic views	3	28-04-2025		TLM1	
29.	Practice	2	01-05-2025		TLM1	
30.	Conversion of isometric views to orthographic views	3	05-05-2025		TLM3	
31.	Conversion of orthographic views to isometric views	2	08-05-2025		TLM1	
32.	Practice	3	12-05-2025		TLM3	
33.	**Computer graphics:** Creating 2D&3D drawings of objects including PCB and Transformations using Auto CAD	2	15-05-2025		TLM2	
No. of classes required to complete UNIT-V: 15 (Lecture:06 Practice: 09)				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
I-Descriptive Examination (Units-I, II)	M1=15
II- Descriptive Examination (UNIT-III, IV & V)	M2=15
Day to Day Evaluation	15
Mid Marks =80% of Max (M1,M2)+ 20% of Min ((M1, M2) + Day to Day Evaluation	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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 designsystem 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 anunderstanding 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 professionalengineering 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 sustainabledevelopment.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of theengineering 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 anddesign 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 inindependent 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**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of theFaculty	Dr.V.Dhana Raju	Mr.J.Subba Reddy	Mr.J.Subba Reddy	Dr. M B S Sreekara Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),
An ISO 21001:2018,14001:2015,50001:2018 Certified Institution
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. R. Ashok
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II/F **A.Y.:** 2024-25

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

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

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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											2	2	2
CO2	3	2	2	1									2	2	3
CO3	3	2	2	1									3	3	3
CO4	3	2	2	1									3	3	3
CO5	3	2	2	1									2	3	3
1 - Low					**2 –**Medium						**3 -** High				

TEXTBOOKS:

T1 Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.

T2 Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1 Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders

R2 C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft

R3 Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum

R4 Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

R5 Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO’s	1	20-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	21-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	22-01-2025		TLM1	
4.	Overview of time and space complexity	1	24-01-2025		TLM1	
5.	Examples – Time Complexity, Space Complexity	2	27-01-2025 28-01-2025		TLM1	
6.	Revise Arrays-Basic Operations	1	29-01-2025		TLM1	
7.	Searching Techniques: Linear Search	1	31-01-2025		TLM1	
8.	Binary Search & Analysis	2	03-02-2025 04-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	05-02-2025		TLM1	
10.	Insertion Sort & Analysis	1	07-02-2025		TLM1	
11.	Selection Sort & Analysis	1	10-02-2205		TLM1	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	11-02-2025		TLM1	
13.	Linked List Representation	1	12-02-2025		TLM1	
14.	Sing Linked List : Operations	2	14-02-2025 17-02-2025		TLM1	
15.	Double Linked List : Operations	2	18-02-2025 19-02-2025		TLM1	
16.	Circular Single Linked List	1	21-0202025		TLM1	
17.	Circular Double Linked List	2	24-02-2025 25-02-2025		TLM1	
18.	Comparing Arrays and Linked List	1	28-02-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	03-03-2025		TLM1	
20.	Polynomial Addition	1	04-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

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.	Introduction to Stacks : Properties	1	05-03-2025		TLM1	
22.	Operations of Stacks	1	07-03-2025		TLM1	

23.	Implementation of stacks using arrays	1	17-03-2025		TLM1	
24.	Stacks using Linked List	1	18-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	19-03-2025 21-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	24-03-2025 25-03-2025		TLM1	
27.	Checking Balanced Parenthesis	1	26-03-2025		TLM1	
28.	Reversing a List	1	28-03-2025		TLM1	
29.	Backtracking	1	01-04-2025		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	02-04-2025		TLM1	
31.	Implementing queues using arrays	1	02-04-2025		TLM1	
32.	Implementing queues using Linked List	1	04-04-2025		TLM1	
33.	Applications of Queue: Scheduling	2	07-04-2025 08-04-2025		TLM1	
34.	Breadth First Search	2	09-04-2025 11-04-2025		TLM1	
35.	Circular Queue	2	15-04-2025 16-04-2025		TLM1	
36.	Double ended queue	2	21-04-2025 22-04-2025		TLM1	
37.	Applications of Deque	1	23-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	25-04-2025		TLM1	
39.	Representation of Trees	1	28-04-2025		TLM1	
40.	Tree Traversals	2	29-04-2025 30-04-2025		TLM1	
41.	Binary Search Trees-Operations	2	02-05-2025 05-05-2025		TLM1	
42.	Hashing Introduction,	1	06-05-2025		TLM1	
43.	Hash Functions	1	07-05-2025 09-05-2025		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	2	12-05-2025 13-05-2025		TLM1	
45.	Open Addressing: Linear Probing, Quadratic Probing	1	14-05-2025		TLM1	
46.	Double Hashing, Rehashing	1	16-05-2025		TLM1	
No. of classes required to complete UNIT-V: 12				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression	1	24-03-2025					
2.	Towers of Hanoi	1	07-04-2025					
3.	Extendable Hashing	1	17-05-2025					
	No. of classes	3			No. of classes taken:			
II MID EXAMINATIONS (19-05-2025 TO 24-05-2024)								

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. R. Ashok**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. D.Veeraiah**
Signature				

COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem.,(CSM) / A

ACADEMIC YEAR : 2024-2025

COURSE NAME & CODE : ENGINEERING PHYSICS LAB

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

COURSE CREDITS : 1

COURSE INSTRUCTOR : **Dr N Aruna / Dr.N.T.Sarma**

COURSE COORDINATOR : **Dr S Yusub**

Course Objectives:
To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:
CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

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

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes	**Programme Outcomes**											
PO's →	**1**	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**				**1**	1			**1**

CO2.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
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 TEXT BOOKS:

1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- AI&DS

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	3	22-01-2025		**TLM4**	
2.	Demonstration	3	29-01-2025		**TLM4**	
3.	Experiment 1		05-02-2025		**TLM4**	
4.	Experiment 2	3	12-02-2025		**TLM4**	
5.	Experiment 3	3	19-02-2025		**TLM4**	
6.	Experiment 4	3	05-03-2025		**TLM4**	
7.	Experiment 5	3	12-03-2025		**TLM4**	
8.	MID -1	3	19-03-2025		**TLM4**	
9.	Demonstration	3	26-03-2025		**TLM4**	
10.	Experiment 6	3	02-04-2025		**TLM4**	
11.	Experiment 7	3	09-04-2025		**TLM4**	
12.	Experiment 8	3	16-04-2025		**TLM4**	
13.	Experiment 9	3	23-04-2025		**TLM4**	
14.	Experiment 10	3	30-04-2025		**TLM4**	
15.	**Internal Exam**	3	07-05-2025		**TLM4**	
16.	**Internal Exam**	3	14-05-2025		**TLM4**	
	No. of classes required to complete Syllabus:			48		

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

EVALUATION PROCESS:

Evaluation Task	**Marks**
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

1.To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.
2. To Function professionally in the rapidly changing world with advances in technology.
3. To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.
4. To Exercise leadership qualities, at levels appropriate to their experience, which addresses issues in a responsive, ethical, and innovative manner .

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

(2). **Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

(3). **Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

(4). **Conduct investigations of complex problems**: Use research-based knowledge and 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 modelling to complex engineering activities with an understanding of the limitations.

(6). **The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
(7).**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
(8). **Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
(9). **Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
(10). **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
(11). **Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
(12).**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the ECE will have the ability to
(1) Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
(2) Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools
(3) Apply the Signal processing techniques to synthesize and realize the issues related to real time applications.

Dr N Aruna / Dr.N.T.Sarma	Dr. S. Yusub	Dr. S. Yusub	Dr A. Rami Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.P.SRIHARI
Course Name & Code : ELECTRICAL & ELECTRONICS ENGINEERING WORKSHOP & 23EE51
L-T-P Structure : **0-0-3** **Credits: 1.5**
Program/Branch/Sem/Sec: B.Tech/CSE-F, II SEM **A.Y.:** 2024-25

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

COURSE DELIVERY PLAN (LESSON PLAN): ELECTRICAL ENGINEERING

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 PRECUATIONS & Other suggestions.	3	24-01-2025		TLM4	
2.	Verification of KCL and KVL	3	31-01-2025		TLM4	
3.	Verification of Superposition theorem	3	07-02-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	07-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	14-02-2025		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	21-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	28-02-2025		TLM4	
8.	Internal Lab Examination (**Electrical**)	3	07-03-2025		TLM4	
No. of classes required: 21				**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	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.
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.

Date: 20-01-2025

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

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, CSE-F SECTION

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr. Mallikarjuna Rao Dandu, Sr. Assistant Professor,
Dr. L. Prabhu, Associate Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction	3	21-01-2025		TLM8	-	
2.	Experiment-1	3	28-01-2025		TLM8	R1	
3.	Experiment-2	3	04-02-2025		TLM8	R1	
4.	Experiment-3	3	11-02-2025		TLM8	R1	
5.	Experiment-4	3	18-02-2025		TLM8	R1	
6.	Experiment-5	3	25-02-2025		TLM8	R1	
7.	Experiment-6	3	04-03-2025		TLM8	R1	
I-Mid Examinations (10-03-2025 to 15-03-2025)							
8.	Experiment-7	3	18-03-2025		TLM8	R1	
9.	Experiment-8	3	25-03-2025		TLM8	R1	
10.	Experiment-9	3	08-04-2025		TLM8	R1	
11.	Experiment-10	3	15-04-2025		TLM8	R1	
12.	Repetition lab	3	22-04-2025		TLM8	--	
13.	Repetition lab	3	29-04-2025		TLM8	--	
14.	Repetition lab	3	06-05-2025		TLM8	--	
15.	Lab Internal	3	13-05-2025		TLM6	--	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical’s	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: A-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B11	24761A05W8 TO 24761A05X6	9	B21	24761A05AB TO 24761A05AI	8
B12	24761A05X7 TO 24761A05Y4	8	B22	24761A05AJ TO 24761A05AQ	8
B13	24761A05Y5Y5 TO 24761A05Z2	8	B23	24761A05AR TO 24761A05AY	8
B14	24761A05Z3 TO 24761A05AA	8	B24	24761A05DN TO 24761A05BG	8

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

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dove Tail Joint	CO1
3.	Fitting-1(F1)-L-Joint	CO2
4.	Fitting-2(F2)-V-Joint	CO2
5.	Plumbing-1(P1)-Pipe Threading practice	CO3
6.	Plumbing-2(P2)-Pipe Layout	CO3
7.	House Wiring-1(E1)–Series and Parallel connection	CO4
8.	HouseWiring-2(E2)–Fluorescent Lamp and Calling Bell Circuit	CO4
9.	Tinsmity-1(T1)- Rectangular Tray	CO2
10.	Demonstration- Welding and Foundry	CO2

NOTIFICATION OF CYCLE:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle 1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
	2.	Carpentry-2(C2)-Dove tail Joint	CO1
	3.	Fitting-1(F1)-T-Joint	CO2
	4.	Fitting-2(F2)-V-Joint	CO2
	5.	Plumbing-1(P1)-Pipe Threading practice	CO3
Cycle 2	6.	Plumbing-2(P2)-Pipe Layout	CO3
	7.	House Wiring-1(E1)–Series and Parallel Connection	CO4
	8.	House Wiring-2(E2)–Fluorescent Lamp and Calling bell Circuit	CO4
	9.	Tinsmity-1(T1)- Rectangular Tray	CO2
	10.	Demonstration- Welding and Foundry	CO2

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Mr. Mallikarjuna Rao Dandu **Dr. L. Prabhu**	**Mr. S. Srinivasa Reddy**	**Mr. J. Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. R. Ashok
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure **: 0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/F **A.Y.:** 2024-25

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	HOD Sign
1.	Array Manipulations	3	25-01-2025		
2.	Searching and Sorting Techniques	3	01-02-2025		
3.	Single Linked List	3	08-02-2025		
4.	Double Linked List	3	15-02-2025		
5.	Circular Linked List	3	22-02-2025		
6.	Polynomial Representation & Polynomial Addition	3	01-03-2025		
7.	Linked List Applications	3	22-03-2025		
8.	Stack Implementation	3	29-03-2025		
9.	Stack Applications	3	05-04-2025		
10.	Queue Implementation & Circular Queue	3	19-04-205		
11.	Double Ended Queue	3	26-04-2025		
12.	Trees	3	03-05-2025		
13.	Hashing	3	10-05-2025		
14.	Internal Exam	3	17-05-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. R. Ashok	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	**Dr. D. Veeraiah**
Signature				

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**:I B.Tech.,II-Sem.,CSE-G**
ACADEMICYEAR	**:2024-25**
COURSENAME &CODE	**: ENGINEERING PHYSICS**
L-T-PSTRUCTURE	**:4-0-0**
COURSECREDITS	**3**
COURSEINSTRUCTOR	**:Dr. P. Sobhanachalam**
PRE-REQUISITE	**:Basic Knowledge of Physics**

Course Objectives:

To bridge the gap between the physics in school at 10+2 level and UG level engineering courses by identifying the importance of the optical phenomenon like interference, diffraction etc, enlightening the periodic arrangement of atoms in crystalline solids and concepts of quantum mechanics, introduce novel concepts of dielectric and magnetic materials, physics of semiconductors.

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

CO1	Analyze the intensity variation of light due to interference, diffraction and Polarization (Apply)
CO2	Understand the basics of crystals and their structures (Understand)
CO3	Summarize various types of polarization of dielectrics and classify the magnetic materials (Understand)
CO4	Explain fundamentals of quantum mechanics and free electron theory of metals (Understand)
CO5	Interpret the type of semiconductor using Hall Effect (Apply)

COURSEARTICULATIONMATRIX(Correlation between COs, Pos & PSOs):

ENGINEERING PHYSICS												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1. →	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO2.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO3.	**3**	**3**	**2**	**1**	**1**	**1**						**1**
CO4.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
CO5.	**3**	**3**	**2**	**1**	**1**	**1**	**1**					**1**
1 = Slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

TEXT BOOKS

1. A Text book of "Engineering Physics" M.N. Avadhanulu, P.G. Kshirsagar, TVS Arun Murthy, S. Chand & Co., 11th Edition, 2019.
2. Engineering Physics – *D.K. Bhattacharya & Poonam Tandon, Oxford press (2015)*

REFERENCES

1. Engineering Physics -B.K.Pandey& S. Chaturvedi, Cengage Learning 2021.
2. Engineering Physics -Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. Engineering Physics -Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press 2010.
4. Engineering Physics -M.R. Srinivasan, New Age international publishers (2009).

WEBRESOURCES

1. http://www.loc.gov/rr/scitech/selected-internet/physics.html
2. http://www.freebookcentre.net/Physics/Solid-State-Physics-Books.html
3. http://physicsdatabase.com/free-physics-books/
4. http://www.e-booksdirectory.com
5. http://www.thphys.physics.ox.ac.uk

TEACHINGLEARNINGMETHODS			
TLM-1	Chalk and Talk	**TLM-4**	Demonstration(Lab/Field Visit)
TLM-2	PPT/A illustrations	**TLM-5**	ICT(NPTEL/Swayam Prabha /MOOCS)
TLM-3	Tutorial/Quiz/Assignment	**TLM-6**	Group Discussion/Project

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE,DIFFRACTION& POLARIZATION

Course Outcome :-CO1;TextBook:-T1,R2

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	20.1.25		**TLM-2**		
2.	Principle of superposition, Interference of light	1	21.1.25		**TLM-3**		
3.	Interference in thin films by reflection & applications	1	22.1.25		**TLM-2**		
4.	Interference in thin films by reflection & applications	1	25.1.25		**TLM-2**		
5.	Colors in thin films, Newton's rings	1	27.1.25		**TLM-1**		
6.	Determination of wavelength and refractive index	1	28.1.25		**TLM-4**		
7.	Problems&	1	29.1.25		**TLM-1**		

	Assignment/Quiz						
8.	Introduction, Fresnel and Fraunhoffer diffractions	1	1.2.25		**TLM-3**		
9.	Fraunhoffer diffraction due to single slit	1	3.2.25		**TLM-2**		
10.	Double slit& N slits(Qualitative)	1	4.2.25		**TLM-4**		
11.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	5.2.25		**TLM-4**		
12.	Problems& Assignment/Quiz	1	8.2.25		**TLM-3**		
13.	Introduction – Types of polarization	1	10.2.25		**TLM-2**		
14.	Polarization by reflection, refraction & double refraction	1	11.2.25		**TLM-2**		
15.	Nicol's prism	1	12.2.25		**TLM-5**		
16.	Half wave and Quarter wave plates	1	15.2.25		**TLM-2**		
17.	Problems& Assignment/Quiz	1	17.2.25		**TLM-3**		
18.	Problems& Assignment/Quiz	1	18.2.25		**TLM-3**		
No.of classes required to complete UNIT-I:18				No.of classes taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

Course Outcome :-CO2;TextBook:-T1,R2

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	19.2.25		**TLM-3**		
2.	Bravais Lattices	1	22.2.25		**TLM-2**		
3.	Crystal Systems(3D)	1	24.2.25		**TLM-2**		
4.	Coordination number – Packing fraction of –SC, BCC	1	25.2.25		**TLM-1**		
5.	Coordination number – Packing fraction of FCC	1	1.3.25		**TLM-1**		
6.	Miller indices& Properties,	1	3.3.25		**TLM-2**		

	Separation between successive (hkl) planes						
7.	Bragg's law; X–ray Diffractometer	1	4.3.25		**TLM-3**		
8.	Crystal Structure determination by Laue's method	1	5.3.25		**TLM-2**		
9.	Crystal Structure determination by Powder method	1	8.3.25		**TLM-5**		
10.	MID-1 Examinations	1	10.4.25		----		
11.	MID-1 Examinations	1	11.3.25		----		
12.	MID-1 Examinations	1	12.3.25		----		
13.	MID-1 Examinations	1	15.3.25		----		
No.of classes required to complete UNIT-II: 13				No.of classes taken:			

UNIT-III :DIELECTRIC & MAGNETIC MATERIALS

Course Outcome :-CO3;TextBook:-T1,R2

S.No	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dielectric polarization Dielectric polarizability, Susceptibility	1	17.3.25		**TLM-2**		
2.	Dielectric constant & Displacement Vector, Relation between the electric vectors	1	18.3.25		**TLM-3**		
3.	Types of polarizations-Electronic polarization	1	19.3.25		**TLM-1**		
4.	Types of polarizations- ionic & orientation polarizations (Qualitative)	1	22.3.25		**TLM-1**		
5.	Lorentz internal field	1	24.3.25		**TLM-2**		
6.	Claussius-Mosotti equation, Complex dielectric constant	1	25.3.25		**TLM-1**		
7.	Frequency dependence of polarization	1	26.3.25		**TLM-5**		

	dielectric loss						
8.	Problems& Assignment/Quiz	1	29.3.25		**TLM-3**		
9.	Introduction Magnetic dipole moment, Magnetization Magnetic susceptibility & permeability	1	1.4.25		**TLM-4**		
10.	Atomic origin of magnetism	1	2.4.25		**TLM-1**		
11.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	7.4.25		**TLM-2**		
12.	Domain concept for Ferromagnetism & Domain walls	1	8.4.25		**TLM-2**		
13.	Hysteresis	1	9.4.25		**TLM-5**		
14.	soft and hard magnetic materials	1	12.4.25		**TLM-1**		
15.	Problems& Assignment/Quiz	1	15.4.25		**TLM-3**		
No.of classes required to complete UNIT-III:15				No.of classes taken:			

UNIT-IV :QUANTUM MECHANICS&FREEELECTRONTHEORY

Course Outcome :-CO4;TextBook:-T1,R2

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter, De-Broglie's Hypothesis	1	16.4.25		**TLM-2**		
2.	Heisenberg's Uncertainty Principle	1	19.4.25		**TLM-2**		
3.	Significance & properties of wave function	1	21.4.25		**TLM-2**		
4.	Schrodinger's time independent and dependent wave equations	1	22.4.25		**TLM-1**		
5.	Particle in a one – dimensional infinite potential well	1	23.4.25		**TLM-1**		
6.	Problems& Assignment/Quiz	1	26.4.25		**TLM-3**		
7.	Classical free electron theory- merits and demerits, Quantum free	1	28.4.25		**TLM-2**		

	electron theory						
8.	Electrical conductivity based on quantum free electron theory	1	29.4.25		**TLM-1**		
9.	Fermi -Dirac distribution and temperature dependence	1	30.4.25		**TLM-5**		
10.	Density of states,	1	3.5.25		**TLM-1**		
No.of classes required to complete UNIT-IV:10				No.of classes taken:			

UNIT-V:SEMICONDUCTORPHYSICS

CourseOutcome :-CO5;TextBook:-T2,R1

S.No.	**Topics to be covered**	**No.of Classes Required**	**Tentative Date of Completion**	**Actual Date of Completion**	**Teaching Learning Methods**	**HOD Sign**	**Remarks**
1.	Formation of energy bands, Classification of crystalline solids	1	5.5.25		**TLM-6**		
2.	Intrinsic semiconductors, Density of charge carriers	1	6.5.25		**TLM-1**		
3.	Electrical conductivity, Fermi level	1	7.5.25		**TLM-2**		
4.	Extrinsic semiconductors, Density of charge carriers	1	10.5.25		**TLM-1**		
5.	Dependence of Fermi energy on carrier concentration &temperature	1	12.5.25		**TLM-2**		
6.	Drift and Diffusion Currents, Einstein's equation	1	13.5.25		**TLM-1**		
7.	Hall Effect & its applications	1	14.5.25		**TLM-4**		
8.	Problems& Assignment/Quiz	1	17.5.25		**TLM-3**		
9.	MID-2 Examinations	1	2.6.25		**----**		
10.	MID-2 Examinations	1	3.6.25		**----**		
11.	MID-2 Examinations	1	4.6.25		**----**		
No.of classes required to complete UNIT-V:11				No.of classes taken:			

PART-C

EVALUATION PROCESS(R-23Regulation)

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

PROGRAMMEOUTCOMES(POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineeringfundamentals,andanengineeringspecializationtothesolutionofcomplex engineeringproblems.
PO 2	**Problemanalysis**:Identify,formulate,reviewresearchliterature,andanalyze complexengineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics,naturalsciences,and engineeringsciences.
PO 3	**Design/developmentofsolutions**:Designsolutionsforcomplexengineeringproblems and design system components or processes that meet the specified needswithappropriateconsiderationforthepublichealthandsafety,andthecultural, societal,andenvironmentalconsiderations.
PO 4	**Conductinvestigationsofcomplexproblems**:Useresearch-basedknowledgeand researchmethodsincludingdesignofexperiments,analysisandinterpretationofdata,andsynthesisoftheinformationtoprovidevalidconclusions.
PO 5	**Moderntoolusage**:Create,select,andapplyappropriatetechniques,resources,and modernengineeringandITtoolsincludingpredictionandmodelingtocomplexengineeringactivitieswithanunderstandingofthe limitations
PO 6	**The engineer and society**:Apply reasoninginformedby the contextual knowledgetoassesssocietal,health,safety,legalandculturalissuesandtheconsequent responsibilitiesrelevanttotheprofessionalengineeringpractice
PO 7	**Environmentandsustainability**:Understandtheimpactoftheprofessionalengineeringsolutionsinsocietalandenvironmentalcontexts,anddemonstratethe knowledgeof,andneed forsustainabledevelopment.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilitiesandnormsoftheengineeringpractice.

PO 9	**Individualandteamwork**:Functioneffectivelyasanindividual,andasamember orleaderindiverseteams,andinmultidisciplinarysettings.
PO 10	**Communication**: Communicate effectively on complex engineering activities withtheengineeringcommunityandwithsocietyatlarge,suchas,beingabletocomprehenda ndwriteeffectivereportsanddesigndocumentation,makeeffective presentations,andgiveandreceiveclearinstructions.
PO 11	**Projectmanagementandfinance**: Demonstrate knowledge andunderstandingofthe engineering and management principles and apply these to one's own work, as amemberandleaderinateam,tomanageprojectsandinmultidisciplinary environments.
PO 12	**Life-longlearning**:Recognizetheneedforandhavethepreparationandabilityto engageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

CourseInstructor	CourseCoordinator	ModuleCoordinator	HOD
Dr. P. Sobhanachalam	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.A.RAMIREDDY**

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "*Thomas Calculus*", 14^{th} 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*", 5^{th} Edition, Pearson Publishers, 2018.

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	20-01-25		TLM2			
2.	Course Outcomes, Program Outcomes	1	21-01-25		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	22-01-25		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	23-01-25		TLM1	CO1	T1,T2	
5.	Bernoulli’s DE	1	25-01-25		TLM1	CO1	T1,T2	
6.	Exact DE	1	27-01-25		TLM1	CO1	T1,T2	
7.	Exact DE	1	28-01-25		TLM1	CO1	T1,T2	
8.	TUTORIAL – I	1	29-01-25		TLM3	CO1	T1,T2	
9.	Non-exact DE Type-I	1	30-01-25		TLM1	CO1	T1,T2	
10.	Non-exact DE Type II	1	01-02-25		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	03-02-25		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	04-02-25		TLM1	CO1	T1,T2	
13.	TUTORIAL – II	1	05-02-25		TLM3	CO1	T1,T2	
14.	Newton’s Law of cooling	1	06-02-25		TLM1	CO1	T1,T2	
15.	Newton’s Law of cooling	1	08-02-25		TLM1	CO1	T1,T2	
16.	Law of natural growth and decay	1	10-02-25		TLM1	CO1	T1,T2	
17.	Electrical circuits	1	11-02-25		TLM1	CO1	T1,T2	
18.	TUTORIAL – III	1	12-02-25		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		16			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19.	Introduction to UNIT II	1	13-02-25		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	15-02-25		TLM1	CO1	T1,T2	
21.	Solving a homogeneous DE	1	17-02-25		TLM1	CO1	T1,T2	

22.	Finding Particular Integral, P.I for e^{ax+b}	1	18-02-25		TLM1	CO1	T1,T2	
23.	TUTORIAL – IV	1	19-02-25		TLM3	CO1	T1,T2	
24.	P.I for Cos bx, or sin bx	1	20-02-25		TLM1	CO1	T1,T2	
25.	P.I for polynomial function	1	22-02-25		TLM1	CO1	T1,T2	
26.	P.I for $e^{ax+b}v(x)$	1	24-02-25		TLM1	CO1	T1,T2	
27.	P.I for $x^k v(x)$	1	25-02-25		TLM1	CO1	T1,T2	
28.	Method of Variation of parameters	1	27-02-25		TLM1	CO1	T1,T2	
29.	Method of Variation of parameters	1	01-03-25		TLM1	CO1	T1,T2	
30.	Simultaneous linear equations	1	03-03-25		TLM1	CO1	T1,T2	
31.	Simultaneous linear equations	1	04-03-25		TLM1	CO1	T1,T2	
32.	TUTORIAL –V	1	05-03-25		TLM3	CO1	T1,T2	
33.	L-C-R circuits	1	06-03-25		TLM1	CO1	T1,T2	
34.	Simple Harmonic motion	1	08-03-25		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
35.	Introduction to Unit III	1	17-03-25		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary constants	1	18-03-25		TLM1	CO2	T1,T2	
37.	TUTORIAL -VI	1	19-03-25		TLM3	CO2	T1,T2	
38.	Formation of PDE by elimination of arbitrary functions	1	20-03-25		TLM1	CO2	T1,T2	
39.	Formation of PDE by elimination of arbitrary functions	1	22-03-25		TLM1	CO2	T1,T2	
40.	Solving of PDE	1	24-03-25		TLM1	CO2	T1,T2	
41.	Solving of PDE	1	25-03-25		TLM1	CO2	T1,T2	
42.	TUTORIAL -VII	1	26-03-25		TLM3	CO4	T1,T2	
43.	Lagrange’s Method	1	27-03-25		TLM1	CO2	T1,T2	
44.	Lagrange’s Method	1	29-03-25		TLM1	CO2	T1,T2	
45.	Homogeneous Linear PDE with constant coefficients	1	01-04-25		TLM1	CO2	T1,T2	
46.	TUTORIAL -VIII	1	02-04-25		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
47.	Introduction to UNIT IV	1	03-04-25		TLM1	CO3	T1,T2	
48.	Vector Differentiation	1	07-04-25		TLM1	CO3	T1,T2	
49.	Gradient	1	08-04-25		TLM1	CO3	T1,T2	
50.	TUTORIAL -IX	1	09-04-25		TLM3	CO3	T1,T2	
51.	Directional Derivative	1	10-04-25		TLM1	CO3	T1,T2	
52.	Divergence	1	12-04-25		TLM1	CO3	T1,T2	
53.	Curl	1	15-04-25		TLM1	CO3	T1,T2	
54.	TUTORIAL -X	1	16-04-25		TLM3	CO3	T1,T2	
55.	Solenoidal fields, Irrotational fields, potential surfaces	1	17-04-25		TLM1	CO3	T1,T2	
56.	Solenoidal fields, Irrotational fields, potential surfaces	1	19-04-25		TLM1	CO3	T1,T2	
57.	Laplacian, second order operators	1	21-04-25		TLM1	CO3	T1,T2	
58.	Vector Identities	1	22-04-25		TLM1	CO3	T1,T2	
59.	TUTORIAL -XI	1	23-04-25		TLM3	CO3	T1,T2	
60.	Vector Identities	1	24-04-25		TLM1	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
61.	Introduction to Unit-V	1	26-04-25		TLM1	CO4	T1,T2	
62.	Line Integral	1	28-04-25		TLM1	CO4	T1,T2	
63.	Circulation	1	29-04-25		TLM1	CO4	T1,T2	
64.	TUTORIAL -XII	1	30-04-25		TLM3	CO4	T1,T2	
65.	Work done	1	01-05-25		TLM1	CO4	T1,T2	
66.	Surface Integral	1	03-05-25		TLM1	CO4	T1,T2	
67.	Surface Integral	1	05-05-25		TLM1	CO4	T1,T2	
68.	Flux	1	06-05-25		TLM1	CO4	T1,T2	
69.	TUTORIAL -XIII	1	07-05-25		TLM3	CO4	T1,T2	
70.	Green’s Theorem	1	08-05-25		TLM1	CO4	T1,T2	
71.	Green’s Theorem	1	10-05-25		TLM1	CO4	T1,T2	

72.	Stoke's Thoerem	1	12-05-25		TLM1	CO3	T1,T2	
73.	Divergence Theorem	1	13-05-25		TLM1	CO3	T1,T2	
74.	TUTORIAL-XIV	1	14-05-25		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
	Non-homogeneous Linear PDE with constant coefficients	2	15-05-25 17-05-25		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

COURSE HANDOUT

PART-A

Name of Course Instructor: / Mr.P.Rathnakar Kumar
Course Name & Code: BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : 3-0-0 **Credits:** 3
Program/Branch/Sem/Sec: B.Tech/CSE-G II SEM **A.Y.:** 2024-25

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	3	2	3	_	_	_	_	_	_	_	_	1
CO 2	2	2	_	_	_	_	_	_	_	_	_	_
CO 3	2	2	_	_	_	3	_	_	_	_	2	2
CO 4	3	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):

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	20-01-2025		TLM1	
2.	Ohm's Law and its limitations	1	23-01-2025		TLM1	
3.	KCL & KVL	1	24-01-2025		TLM1	
4.	series, parallel, series-parallel circuits	1	25-01-2025		TLM1	
5.	Problems	1	27-01-2025		TLM3	
6.	Super Position theorem	1	30-01-2025		TLM1	
7.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	31-01-2025		TLM2	
8.	average value, RMS value, form factor, peak factor	1	01-02-2025		TLM1	
9.	RLC Circuits	1	03-02-2025		TLM1	
10.	Impedance, Power	1	06-02-2025		TLM1	
11.	Problems	1	07-02-2025		TLM3	
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	1	10-02-2025		TLM2	
13.	Construction, principle and operation of (ii) DC Generator.		13-02-2025		TLM2	
14.	Single Phase Transformer	1	14-02-2025		TLM2	
15.	Three Phase Induction Motor	1	15-02-2025		TLM2	
16.	Alternators	1	17-02-2025		TLM2	
17.	Applications of electrical machines	1	20-02-2025		TLM2	
18.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	21-02-2025		TLM2	
19.	Moving Iron (MI) Instruments	1	22-02-2025		TLM2	
20.	Wheat Stone bridge	1	24-02-2025		TLM2	
21.	Problems	1	27-02-2025		TLM3	
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
22.	Conventional and non-conventional energy resources	1	28-02-2025		TLM2	
23.	Hydel & Nuclear power generation	1	01-03-2025		TLM2	
24.	Solar & Wind power plants	1	03-03-2025		TLM2	
25.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	06-03-2025		TLM2	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	07-03-2025		TLM2	
27.	calculation of electricity bill for domestic consumers.	1	08-03-2025		TLM2	
28.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	17-03-2025		TLM2	
29.	Personal safety measures: Electric Shock	1	20-03-2025		TLM2	
30.	Earthing and its types& Safety Precautions	1	21-03-2025		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
31.	Introduction	1	22-03-2025		TLM1	
32.	Evolution of electronics – Vacuum tubes to nano electronics	1	24-03-2025		TLM2	
33.	PN Junction diode	1	27-03-2025		TLM2	
34.	Characteristics of PN Junction Diode	1	28-03-2025		TLM2	
35.	Zener Effect — Zener Diode and its Characteristics	1	29-03-2025		TLM2	
36.	Bipolar Junction Transistor	1	31-03-2025		TLM2	
37.	CB Configuration	1	03-04-2025		TLM2	
38.	CE Configuration	1	04-04-2025		TLM2	
39.	CC Configuration	1	05-04-2025		TLM2	
40.	Elementary Treatment of Small Signal CE Amplifier.	1	07-04-2025		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
41.	Introduction	1	10-04-2025		TLM1	
42.	Block diagram RPS	1	11-04-2025		TLM1	
43.	working of a full wave bridge rectifier	1	12-04-2025		TLM1	
44.	capacitor filter	1	14-04-2025		TLM1	
45.	working of simple zener voltage regulator	1	17-04-2025		TLM1	
46.	Block diagram of Public Address system	1	18-04-2025		TLM1	
47.	Circuit diagram and working of RC coupled amplifier	1	19-04-2025		TLM1	
48.	Frequency response.	1	21-04-2025		TLM1	
49.	Electronic Instrumentation	1	24-04-2025		TLM1	

50.	Block diagram of an electronic instrumentation system	1	25-04-2025		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	26-04-2025		TLM2	
56.	Logic gates	1	28-04-2025		TLM1	
57.	BCD & XS-3 code	1	01-05-2025		TLM2	
58.	Gray and Hamming code	1	02-05-2025		TLM1	
59.	Basic theorems & Boolean Algebra	1	03-05-2025		TLM2	
61.	Logic diagrams using logic gates only	1	05-05-2025		TLM2	
62.	Combinational Vs Sequential circuits	1	08-05-2025		TLM1	
63.	Half & Full adder	1	09-05-2025		TLM1	
65.	Introduction to sequential circuits,	1	10-05-2025		TLM1	
66.	Flip flops- SR & D	1	12-05-2025		TLM2	
67.	Flip flops- JK & T	1	15-05-2025		TLM2	
68.	Registers & counters	1	16-05-2025		TLM1	
69	**Content Beyond the Syllabus:** Op-Amp and Applications	1	17-05-2025		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 (R23 Regulation):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr P.Rathnakar Kumar**			
Signature				

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr. P. Ravindra Kumar, Professor,
Dr. S.Rami Reddy, Sr.Asst.Professor
Dr. A.Nageswara Rao, Sr. Asst. Professor,

Course Name & Code	**:** Engineering Drawing – 23ME01	
L-T-P Structure	**:** 3-0-4	**Credits:** 4
Program/Sem/Sec	: B.Tech/II Sem	**A.Y.:** 2024-25

COURSE EDUCATIONAL OBJECTIVES (CEOs): To recognize the Bureau of Indian Standards of Engineering Drawing and develop an ability to get familiarized with orthographic projections and isometric views of solid objects.

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

CO1	Understand the principles of engineering drawing, including engineering curves, scales, Orthographic and isometric projections. (**Understanding Level –L2**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Applying Level –L3**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Applying Level –L3**)
CO4	Draw the development of surfaces of simple objects. (**Applying Level –L3**)
CO5	Prepare isometric and orthographic sections of simple solids. (**Applying Level –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	2	-	-	-	-	-	-	-	-	3	2	1	2
CO2	3	2	1	2	-	-	-	-	-	-	-	3	1	1	2
CO3	3	2	2	-	-	-	-	-	-	-	-	3	-	1	2
CO4	3	2	2	-	-	-	-	-	-	-	-	3	2	1	2
CO5	3	2	2	-	-	-	-	-	-	-	-	3	-	-	-
1 - Low				**2** –Medium					**3 -** High						

TEXTBOOKS:

T1 N. D. Bhatt, Engineering Drawing, 51th Revised and Enlarged Edition, Charotar publishers,2012

REFERENCE BOOKS:

R1 Narayana K L, Kannaiah P, Textbook on Engineering Drawing, 2nd Edition, SciTech publishers.
R2 R.K.Dhawan, Engineering Drawing, S.Chand Company LTD.
R3 Venugopal, Engineering Drawing and Graphics, New Age publishers
R4 Dhananjay A. Jolhe, Engineering Drawing, Tata McGraw Hill Publishers
R5 N.S.Parthasarathy, Vela Murali, Engineering Drawing, Oxford Higher Education

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, LINES AND DIMENSIONING, CONICS, CYCLOIDS, INVOLUTES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
1	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, CEOs, COs, PEOs, and POs and PSOs	3	21-01-2025		TLM1/ TLM2	
2	Principles of Engineering Graphics and their significance, Drawing Instruments and their use- Conventions in Drawing – Practical orientation					
3	Lettering and Dimensioning – BIS Conventions- Geometrical Constructions – Theory Class	2	24-01-2025		TLM1/ TLM2	
4	Practice	3	28-01-2025		TLM4	
5	Engineering Curves: Conic Sections- Construction of ellipse, parabola and Hyperbola –Theory class	2	31-01-2025		TLM1/ TLM2	
6	Construction of Parabola, ellipse, hyperbola – General method -Practice	3	04-02-2025		TLM4	
7	Cycloids and Involutes–Theory class	2	07-02-2025		TLM1/ TLM5	
8	Construction of Cycloids and Involutes – Practice	3	11-02-2025		TLM4	
No. of classes required to complete UNIT-I: 18 (Lecture:6 Practice:12)				**No. of classes taken: (including Practice)**		

UNIT-II: PROJECTIONS OF POINTS, LINES AND PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
9	Orthographic Projections, First and third angle projection methods, Projections of Points, Lines inclined to one plane	2	14-02-2025		TLM1/ TLM2	
10	Practice	3	18-02-2025		TLM4	
11	Projection of lines - Projections of Straight Line Inclined to both the reference planes	2	21-02-2025		TLM1/ TLM2	
12	Practice	3	25-02-2025		TLM4	
13	Projections of planes- Regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.	2	28-02-2025		TLM1/ TLM2	
14	Practice	3	04-03-2025		TLM4	
15	Revision	2	07-03-2025		TLM1/ TLM2	
No. of classes required to complete UNIT-II: 15 (Lecture:6 Practice:9)				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
16	Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane – Theory and practice	3	18-03-2025		TLM1/ TLM2/ TLM4	
17	Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.	2	21-03-2025		TLM1/ TLM2	
18	Practice Session	3	25-03-2025		TLM 4	
No. of classes required to complete UNIT-III: 08 (Lecture:3 Practice:5)				**No. of classes taken: (including Practice)**		

UNIT-IV: SECTIONS OF SOLIDS AND DEVELOPMENT OF SURFACES

S. No.	Topics to be covered	No. of Class Required	Tentative Date	Actual Date	Teaching Learning ng Method	HOD Sign Weekly
19	Sections of Solids Solids in simple positions, Perpendicular and inclined section planes	2	28-03-2025		TLM1/ TLM2	
20	Practice Session	3	01-04-2025		TLM4	
21	Sections of solids: Sectional views and True shape of section	2	04-04-2025		TLM1/ TLM2	
22	Practice	3	08-04-2025		TLM4	
23	Development of solids Methods of Development: Parallel line development and radial line development	2	11-04-2025		TLM1/ TLM2	
24	Practice	3	15-04-2025		TLM4	
25	Development of solids Development of a cube, prism, cylinder, pyramid and cone.	3	22-04-2025		TLM4	
No. of classes required to complete UNIT-IV: 18 (Lecture:6 Practice:12)				**No. of classes taken: (including Practice)**		

UNIT-V: CONVERSION OF VIEWS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
26	Introduction to Isometric Views	2	25-04-2025		TLM1/ TLM2	
27	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes	3	29-04-2025		TLM4	
28	Practice	2	02-05-2025		TLM1/ TLM2	
29	Isometric view of prism, pyramid,cylinder & cone, non-isometric lines- methods to generate an isometricdrawing	3	06-05-2025		TLM4	
30	Practice	2	09-05-2025		TLM1/ TLM2	
31	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing	3	13-05-2025		TLM4	

32	Practice	2	16-05-2025		TLM1/ TLM2	
33	Revision of I Unit	3	20-05-2025		TLM1	
34	Revision of II and III Units	2	23-05-2025		TLM1/ TLM2	
35	Revision of V Unit	3	27-05-2025		TLM1/ TLM2	
36	Revision of IV Unit	2	30-05-2025		TLM1/ TLM2	
No. of classes required to complete UNIT-V: 27 (Lecture:12 Practice:15)				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	**To apply the principles of thermal sciences to design and develop various thermal systems.**
PSO2	**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.**
PSO3	**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	Course Coordinator	Head of the Department
Name of the Faculty	Dr. P.Ravindra Kumar	Mr.J.Subba Reddy	Dr. M B S S Reddy
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC with 'A' Grade & NBA (Under Tier - I),

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

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. SRINIVASA REDDY
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II/G **A.Y.:** 2024-25

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

The objective of the course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

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

CO1	Understand the role of linear and nonlinear data structures in organizing and accessing data **(Understand-L2)**
CO2	Implement abstract data type (ADT) and data structures for given application. **(Apply-L3)**
CO3	Design algorithms based on techniques like linked list, stack, queue, trees etc. **(Apply-L3)**
CO4	Apply the appropriate linear and nonlinear data structure techniques for solving a problem. **(Apply-L3)**
CO5	Design hash-based solutions for specific problems. **(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											2	2	2
CO2	3	2	2	1									2	2	3
CO3	3	2	2	1									3	3	3
CO4	3	2	2	1									3	3	3
CO5	3	2	2	1									2	3	3
1 - Low				**2 –**Medium						**3 -** High					

TEXTBOOKS:

T1 Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2nd Edition.

T2 Fundamentals of data structures in C, Ellis Horowitz, Sartaj Sahni, Susan AndersonFreed, Silicon Press, 2008

REFERENCE BOOKS:

R1 Algorithms and Data Structures: The Basic Toolbox by Kurt Mehlhorn and Peter Sanders

R2 C Data Structures and Algorithms by Alfred V. Aho, Jeffrey D. Ullman, and John E. Hopcroft

R3 Problem Solving with Algorithms and Data Structures" by Brad Miller and David Ranum

R4 Introduction to Algorithms by Thomas H. Cormen, Charles E. Leiserson, Ronald L. Rivest, and Clifford Stein

R5 Algorithms in C, Parts 1-5 (Bundle): Fundamentals, Data Structures, Sorting, Searching, and Graph Algorithms" by Robert Sedgewick

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	21-01-2025		TLM1	
2.	Definition and Importance of Linear Data Structures	1	22-01-2025		TLM1	
3.	Abstract Data Types and Implementation	1	23-01-2025		TLM1	
4.	Overview of time and space complexity	1	25-01-2025		TLM1	
5.	Examples – Time Complexity, Space Complexity	2	28-01-2025 29-01-2025		TLM1	
6.	Revise Arrays-Basic Operations	1	30-01-2025		TLM1	
7.	Searching Techniques: Linear Search	1	01-02-2025		TLM1	
8.	Binary Search & Analysis	2	04-02-2025 05-02-2025		TLM1	
9.	Bubble Sort & Analysis	1	06-02-2025		TLM1	
10.	Insertion Sort & Analysis	1	11-02-2205		TLM1	
11.	Selection Sort & Analysis	1	12-02-2025		TLM1	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT-II: Linked Lists

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.	List Implementation using Arrays and Array Disadvantages	1	13-02-2025		TLM1	
13.	Linked List Representation	1	15-02-2025		TLM1	
14.	Sing Linked List : Operations	2	18-02-2025 19-02-2025		TLM1	
15.	Double Linked List : Operations	2	20-02-2025 22-02-2025		TLM1	
16.	Circular Single Linked List	1	25-0202025		TLM1	
17.	Circular Double Linked List	2	27-02-2025 01-03-2025		TLM1	
18.	Comparing Arrays and Linked List	1	04-03-2025		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	05-03-2025		TLM1	
20.	Polynomial Addition	1	06-03-2025		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

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.	Introduction to Stacks : Properties	1	18-03-2025		TLM1	
22.	Operations of Stacks	1	19-03-2025		TLM1	
23.	Implementation of stacks using arrays	1	20-03-2025		TLM1	

24.	Stacks using Linked List	1	22-03-2025		TLM1	
25.	Expressions: Expression evaluation	2	25-03-2025 26-03-2025		TLM1	
26.	Infix to Postfix Conversion	2	27-03-2025 29-03-2025		TLM1	
27.	Checking Balanced Parenthesis	1	01-04-2025		TLM1	
28.	Reversing a List	1	02-04-2025		TLM1	
29.	Backtracking	1	03-04-2025		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Queues

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 to queues: properties and operations,	1	05-04-2025		TLM1	
31.	Implementing queues using arrays	1	08-04-2025		TLM1	
32.	Implementing queues using Linked List	1	09-04-2025		TLM1	
33.	Applications of Queue : Scheduling	1	10-04-2025		TLM1	
34.	Breadth First Search	1	15-04-2025		TLM1	
35.	Circular Queue	2	16-04-2025 17-04-2025		TLM1	
36.	Double ended queue	2	19-04-2025 22-04-2025		TLM1	
37.	Applications of Deque	1	23-04-2025		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	24-04-2025		TLM1	
39.	Representation of Trees	1	26-04-2025		TLM1	
40.	Tree Traversals	1	29-04-2025		TLM1	
41.	Binary Search Trees- Operations	2	30-04-2025 01-05-2025		TLM1	
42.	Hashing Introduction,	1	03-05-2025		TLM1	
43.	Hash Functions	1	06-05-2025		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	07-05-2025		TLM1	
45.	Open Addressing: Linear Probing, Quadratic Probing	1	08-05-2025		TLM1	
46.	Double Hashing, Rehashing	1	13-05-2025		TLM1	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

Content Beyond 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
1.	Evaluation of Prefix Expression	1	14-05-2025					
2.	Towers of Hanoi	1	15-05-2025					
3.	Extendable Hashing	1	17-05-2025					
	No. of classes	3			No. of classes taken:			
II MID EXAMINATIONS (19-05-2025 TO 24-05-2024)								

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. S. Srinivasa Reddy**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. D.Veeraiah**
Signature				

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

Part-A

PROGRAM	:	**B.Tech.,II-Sem.,CSE-G**
ACADEMICYEAR	:	**2024-25**
COURSENAME &CODE	:	**ENGINEERING PHYSICS LAB**
L-T-PSTRUCTURE	:	**0 – 0 – 3**
COURSECREDITS	:	**1**
COURSEINSTRUCTOR	:	**Dr. P. Sobhanachalam / Dr. N.T. Sarma**
COURSECOORDINATOR	:	

Pre-requisites : **Nil**

Course Objective: To study the concepts of optical phenomenon like interference, diffraction etc., recognize the importance of energy gap in the study of conductivity and Hall effect in semiconductors and study the parameters and applications of dielectric and magnetic materials by conducting experiments.

Course Outcomes:
CO1: Analyze the wave properties of light using optical instruments (Apply-L3).
CO2: Estimate the elastic modulii of various materials and acceleration due to gravity (Apply-L3).
CO3: Demonstrate the vibrations in stretched strings (Understand-L2).
CO4: Evaluate dielectric constant and magnetic field of circular coil carrying current (Apply-L3).
CO5: Examine the characteristics of semiconductor devices (Apply-L3).

Course articulation matrix (Correlation between CO's and PO's):

Engineering Physics Lab												
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**											
Course Outcomes PO's →	**Programme Outcomes**											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO2.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

List of Experiments

1. Determination of radius of curvature of a given Plano - Convex lens by Newton's rings.
2. Determination of dielectric constant using charging and discharging method.
3. Determination of wavelength of a laser light using diffraction grating.
4. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
5. Determination of temperature coefficients of a thermistor.
6. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
7. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.
8. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
9. Sonometer- Verification of laws of a stretched string.
10. Determination of energy band gap of a semiconductor using p-n junction diode.
11. Verification of Brewster's Law.
12. Determination of Hall coefficient and Hall voltage.

References:

- A Textbook of Practical Physics – S. Balasubramanian, M.N. Srinivasan, S. Chand publishers-2017.

BOSAPPROVEDTEXTBOOKS:

1. LabManualPreparedbytheLBRCE.

EVALUATIONPROCESS:

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

Part-B

COURSEDELIVERYPLAN (LESSONPLAN): CSE-G

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
1.	Introduction & Demonstration	3	22.1.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
2.	Experiment1	3	29.1.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
3.	Experiment2	3	5.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
4.	Experiment3	3	12.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
5.	Experiment 3	3	19.2.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
6.	Experiment 4	3	5.3.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
7.	**MID-1 Exam**	3	12.3.25		**---**	---	---	
8.	Experiment5	3	19.3.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
9.	Experiment 6	3	26.3.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
10.	Experiment 7	3	2.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
11.	Experiment8	3	9.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
12.	Experiment 8	3	16.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
13.	Experiment 9	3	23.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
14.	Experiment 10	3	30.4.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
15.	**Internal Exam**	3	7.5.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
16.	**Internal Exam**	3	14.5.25		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
17	**MID-2 Exam**	3	4.6.25					

No.of classes required to completed	16	No.of classes taken:

PROGRAM OUT COMES: Engineering Graduates will be able to:

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

(2).Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

(3).Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

(4). Conduct investigations ofcomplex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of theinformationto provide valid conclusions.

(5). Modern tool usage: Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modeling to complex engineering activities with anunderstandingofthelimitations.

(6). The engineer and society: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

(7). Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.

(8). Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

(9). Individual and teamwork: Function effectively as an individual, and as a member or leader in diverse teams and in multi disciplinary settings.

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

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

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

CourseInstructor	CourseCoordinator	ModuleCoordinator	H.O.D
Dr. P. Sobhanachalam/ Dr. N.T. Sarma	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.A. RAMIREDDY**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.G.Nageswara Rao/ Mr.P.Rathnakar 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/CSE-G, II SEM **A.Y.:** 2024-25

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

COURSE DELIVERY PLAN (LESSON PLAN): ELECTRICAL ENGINEERING

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 PRECUATIONS & Other suggestions. (DEMO)	3	23-01-2025		TLM4	
2.	Verification of KCL and KVL	3	30-01-2025		TLM4	
3.	Verification of Superposition theorem	3	30-01-2025		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	06-02-2025		TLM4	
5.	Magnetization Characteristics of DC shunt Generator	3	13-02-2025		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	20-02-2025		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	27-02-2025		TLM4	
8.	Internal Lab Examination (**Electrical**)	3	06-03-2025		TLM4	
No. of classes required: 21				**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	**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.
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 P.Rathnakar Kumar	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(An Autonomous Institution since 2010)
Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
L.B. Reddy Nagar, Mylavaram, NTR District, Andhra Pradesh - 521230
DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, CSE-G SECTION

ACADEMIC YEAR : 2024-25

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr. Mallikarjuna Rao Dandu, Sr. Assistant Professor,
Mr. K. V. Viswanath, Sr. Assistant Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction	3	20-01-2025		TLM8	-	
2.	Experiment-1	3	27-01-2025		TLM8	R1	
3.	Experiment-2	3	03-02-2025		TLM8	R1	
4.	Experiment-3	3	10-02-2025		TLM8	R1	
5.	Experiment-4	3	17-02-2025		TLM8	R1	
6.	Experiment-5	3	24-02-2025		TLM8	R1	
7.	Experiment-6	3	03-03-2025		TLM8	R1	
I-Mid Examinations (10-03-2025 to 15-03-2025)							
8.	Experiment-7	3	17-03-2025		TLM8	R1	
9.	Experiment-8	3	24-03-2025		TLM8	R1	
10.	Experiment-9	3	07-04-2025		TLM8	R1	
11.	Experiment-10	3	21-04-2025		TLM8	R1	
12.	Repetition lab	3	28-04-2025		TLM8	--	
13.	Repetition lab	3	28-04-2025		TLM8	--	
14.	Lab Internal	3	05-05-2025		TLM6	--	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	13-01-2025	08-03-2025	8W
I Mid Examinations	10-03-2025	15-03-2025	1W
II Phase of Instructions	17-03-2025	17-05-2025	9W
II Mid Examinations	02-06-2025	07-06-2025	1W
Preparation and Practical’s	09-06-2025	14-06-2025	1W
Semester End Examinations	16-06-2025	28-06-2025	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: A-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
B11	24761A05BH TO 24761A05BP	9	B21	24761A05CP TO 24761A05CW	8
B12	24761A05BQ TO 24761A05BX	8	B22	24761A05CX TO 24761A05DE	8
B13	24761A05BY TO 24761A05CG	9	B23	24761A05DF TO 24761A05DM	8
B14	24761A05CH TO 24761A05CO	8	B24	24761A05DN TO 24761A05DU	8

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

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dove Tail Joint	CO1
3.	Fitting-1(F1)-L-Joint	CO2
4.	Fitting-2(F2)-V-Joint	CO2
5.	Plumbing-1(P1)-Pipe Threading practice	CO3
6.	Plumbing-2(P2)-Pipe Layout	CO3
7.	House Wiring-1(E1)–Series and Parallel connection	CO4
8.	HouseWiring-2(E2)–Fluorescent Lamp and Calling Bell Circuit	CO4
9.	Tinsmity-1(T1)- Rectangular Tray	CO2
10.	Demonstration- Welding and Foundry	CO2

NOTIFICATION OF CYCLE:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle 1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
	2.	Carpentry-2(C2)-Dove tail Joint	CO1
	3.	Fitting-1(F1)-T-Joint	CO2
	4.	Fitting-2(F2)-V-Joint	CO2
	5.	Plumbing-1(P1)-Pipe Threading practice	CO3
Cycle 2	6.	Plumbing-2(P2)-Pipe Layout	CO3
	7.	House Wiring-1(E1)–Series and Parallel Connection	CO4
	8.	House Wiring-2(E2)–Fluorescent Lamp and Calling bell Circuit	CO4
	9.	Tinsmity-1(T1)- Rectangular Tray	CO2
	10.	Demonstration- Welding and Foundry	CO2

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Mr. Mallikarjuna Rao Dandu Mr. K. V. Viswanath	**Mr. S. Srinivasa Reddy**	**Mr. J. Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. SRINIVASA REDDY
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/G **A.Y.:** 2024-25

PREREQUISITE: PPSC

COURSE EDUCATIONAL OBJECTIVE:
The objective of this course is to make students familiar with writing algorithms to implement different data structures like stacks, queues, trees and graphs, and various sorting techniques.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO2: Apply Non- Linear Data Structures for organizing the data efficiently **(Apply-L3)**
CO3: Develop and implement hashing techniques for solving problems (**Apply - L3**)
CO4: Improve individual / teamwork skills, communication & report writing skills with ethical values.

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

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

Note: 1- Slight (Low), **2 -** Moderate (Medium), **3 -** Substantial (High)

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	HOD Sign
1.	Array Manipulations	3	24-01-2025		
2.	Searching and Sorting Techniques	3	31-01-2025		
3.	Single Linked List	3	07-02-2025		
4.	Double Linked List	3	14-02-2025		
5.	Circular Linked List	3	21-02-2025		
6.	Polynomial Representation & Polynomial Addition	3	28-02-2025		
7.	Linked List Applications	3	07-03-2025		
8.	Stack Implementation	3	21-03-2025		
9.	Stack Applications	3	28-03-2025		
10.	Queue Implementation & Circular Queue	3	04-04-205		
11.	Double Ended Queue	3	11-04-2025		
12.	Trees	3	25-04-2025		
13.	Hashing	3	02-05-2025		
14.	Internal Exam	3	09-05-2025		

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day to Day Work:	15
Internal Test	15
Continuous Internal Assessment	30
Procedure	20
Execution & Results	30
Viva-voce	20
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	The ability to apply Software Engineering practices and strategies in software project development using open-source programming environment for the success of organization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. S. Srinivasa Reddy	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	**Dr. D. Veeraiah**
Signature				