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: 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.:**2023-24

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												3		
CO2	3	2											2		
CO3	3	3											3		
CO4	3	3											3		
CO5	3	3											2		
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	12-02-2024		TLM1	
2.	Definition and Importance of Linear Data Structures	1	13-02-2024		TLM1	
3.	Abstract Data Types and Implementation	1	14-02-2024		TLM1	
4.	Overview of time and space complexity	1	15-02-2024		TLM1	
5.	Analysis of Liner Data structures	2	17-02-2024 19-02-2024		TLM1	
6.	Revise Arrays	1	20-02-2024		TLM1	
7.	Searching Techniques: Linear Search	1	21-02-2024		TLM1	
8.	Binary Search & Analysis	2	22-02-2024 24-02-2024		TLM1	
9.	Bubble Sort & Analysis	1	26-02-2024		TLM1	
10.	Insertion Sort & Analysis	2	27-02-2024 28-02-2024		TLM1	
11.	Selection Sort & Analysis	2	29-02-2024 02-03-2024		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	04-03-2024		TLM1	
13.	Linked List Representation	1	05-03-2024		TLM1	
14.	Sing Linked List : Operations	3	06-03-2024 07-03-2024 09-03-2024		TLM1	
15.	Double Linked List : Operations	2	11-03-2024 12-03-2024		TLM1	
16.	Circular Single Linked List	1	13-03-2024		TLM1	
17.	Circular Double Linked List	2	14-03-2024 16-03-2024		TLM1	
18.	Comparing Arrays and Linked List	1	18-03-2024		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	19-03-2024		TLM1	
20.	Polynomial Addition	1	20-03-2024		TLM1	
No. of classes required to complete UNIT-II: 13				**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	21-03-2024		TLM1	

22.	Operations of Stacks	1	23-03-2024		TLM1	
23.	Implementation of stacks using arrays	1	26-03-2024		TLM1	
24.	Stacks using Linked List	1	27-03-2024		TLM1	
25.	Expressions: Expression evaluation	2	28-03-2024 30-03-2024		TLM1	
26.	Infix to Postfix Conversion	2	01-04-2024 02-04-2024		TLM1	
27.	Checking Balanced Parenthesis	2	03-04-2024 04-04-2024		TLM1	
28.	Reversing a List	1	06-04-2024		TLM1	
29.	Backtracking	1	08-04-2024		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	10-04-2024		TLM1	
31.	Implementing queues using arrays	1	13-04-2024		TLM1	
32.	Implementing queues using Linked List	1	15-04-2024		TLM1	
33.	Applications of Queue : Scheduling	1	16-04-2024		TLM1	
34.	Breadth First Search	1	18-04-2024		TLM1	
35.	Circular Queue	2	20-04-2024 22-04-2024		TLM1	
36.	Double ended queue	2	23-04-2024 25-04-2024		TLM1	
37.	Applications of Deque	1	27-04-2024		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	29-04-2024		TLM1	
39.	Representation of Trees	1	30-04-2024		TLM1	
40.	Tree Traversals	3	01-05-2024 02-05-2024 04-05-2024		TLM1	
41.	Binary Search Trees-Operations	4	06-05-2024 07-05-2024 08-05-2024 09-05-2024		TLM1	
42.	Hashing Introduction	1	13-05-2024		TLM1	
43.	Hash Functions	1	14-05-2024		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	15-05-2024		TLM1	
45.	Open Addressing: Linear Probing	1	16-05-2024		TLM1	
46.	Quadratic Probing, Double Hashing	1	18-05-2024		TLM1	
47.	Rehashing	1	20-05-2024		TLM1	
48.	Applications of Hashing	1	21-05-2024		TLM1	
49.	Revision	5	27-05-2024 To		TLM1	

			01-06-2024			
No. of classes required to complete UNIT-V: 16				**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	22-05-2024					
2.	Towers of Hanoi	1	23-05-2024					
3.	Extendable Hashing	1	25-05-2024					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/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- DescriptiveExamination (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 engineeringand 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 projectdevelopmentusingopen-sourceprogrammingenvironmentforthesuccessoforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications andIoT asper the societyneeds.
PSO 3	Toinculcateanabilitytoanalyze,designandimplementdatabaseapplications.

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: A. Sree Rama Chandra Murthy
Course Name & Code **:** DATA STRUCTURES LAB & 20CS52
L-T-P Structure **: 0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II **A.Y.:** 2023-24

PREREQUISITE: Introduction to Programming.

COURSE EDUCATIONAL OBJECTIVE:
The course aims to strengthen the ability of the students to identify and apply the suitable data structure for the given real-world problem. It enables them to gain knowledge in practical applications of data structures.

COURSE OUTCOMES (CO):
CO1: Apply Linear Data Structures for accessing the data efficiently **(Apply)**
CO2: Apply Non-Linear Data Structures to traverse data efficiently **(Apply)**
CO3: Develop programs using Stacks, Queues and Hashing Techniques to solve related problems. **(Apply)**
CO4: Improve individual / teamwork skills, communication and report writing skills with ethical values

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	2	1	3								3		
CO2	3	2	2	1	3								3		
CO3	3	2	2	1	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.	Introduction	3	12-02-2024		
2.	Exercise-1	3	19-02-2024		
3.	Exercise-2	3	26-02-2024		
4.	Exercise-3	3	04-03-2024		
5.	Exercise-3	3	11-03-2024		
6.	Exercise-4	3	18-03-2024		
7.	Exercise-4	3	08-04-2024		
8.	Exercise-5	3	15-04-2024		
9.	Exercise-6	3	22-04-2024		
10.	Exercise-7	3	29-04-2024		
11.	Exercise-8	3	06-05-2024		
12.	Exercise-8	3	13-05-2024		
13.	Exercise-9	3	20-05-2024		
14.	Lab Internal	3	27-05-2024		

PART-C

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.
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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 engineeringand 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 projectdevelopmentusingopen-sourceprogrammingenvironmentforthesuccessoforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications andIoT asper the societyneeds.
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	A. S. R. C. Murthy	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	**Dr. D. Veeriah**
Signature				

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.K.Dilip Kumar Professor
Dr.B.Sudheer Kumar Sr. Assistant Professor (A)

Course Name & Code :Engineering Graphics – 23ME01

L-T-P Structure :2-0-4 **Credits:**4

Program/Sem/Sec :CSE /B.Tech/I Sem/A-Section **A.Y.:**2023-24

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

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, Geometrical Constructions, Practice	3	15-02-2024		TLM3	
2.	Engineering Curves: Conic Sections- Ellipse, Parabola, Hyperbola General methods	2	16-02-2024		TLM1	
3.	Practice	3	22-02-2024		TLM3	
4.	Cycloid, Epicycloid and Practice Hypocycloid; Involutes	2	23-02-2024		TLM1	
5.	Introduction to Orthographic Projections, First and third angle projection methods, Practice Projections of Points	3	29-02-2024		TLM3	
6.	Practice	2	01-03-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
7.	**UNIT-2 PROJECTIONS OF STRAIGHT LINES** Projections of straight lines of different orientations when line is parallel to one and inclined to the other, Practice	3	07-03-2024		TLM3	
8.	Projections of lines when inclined to both the planes	3	14-03-2024		TLM1	
9.	**PROJECTIONS OF PLANES:** Introduction to Projection of Planes	2	15-03-2024		TLM3	
10.	Planes parallel to one of the reference planes, Practice	3	21-03-2024		TLM1	
11.	Inclined to one reference plane and perpendicular to other, Practice	2	22-03-2024		TLM3	
No. of classes required to complete UNIT-II: 13				**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
12.	**UNIT III:Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane**	3	28-03-2024		TLM1	
13.	I -MID EXAM		01-04-2024 To 06-04-2024		TLM1, 3	
14.	**Axis parallel to both the reference planes,**	2	12-04-2024		TLM1	
15.	**Projection of Solids with axis inclined to one reference plane and parallel to another plane.**	3	18-04-2024		TLM3	
16.	Practice, Lines	2	19-04-2024		TLM1	
No. of classes required to complete UNIT-III: 10			**No. of classes taken:**			

UNIT-IV: 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.	**UNIT IV: Sections of Solids: Perpendicular and inclined section planes,**	3	25-04-2024		TLM1, 3	
18.	**Sectional views and True shape of section,**	2	26-04-2024		TLM1	
19.	**Sections of solids in simple position only.**	3	02-05-2024		TLM3	
20.	**Development of Surfaces: Methods of Development: Parallel line development and**	2	03-05-2024		TLM1	
21.	**radial line development.**	3	09-05-2024		TLM3	
22.	**Development of a cube, pyramid and cone, cylinder,** Practice	2	10-05-2024		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
23.	**UNIT V: ISOMETRIC VIEWS –** Introduction to Isometric Views, Practice	3	16-05-2024		TLM1, 3	
24.	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes, Practice	2	17-05-2024		TLM1	
25.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing, Practice	3	23-05-2024		TLM3	
26.	**TRANSFORMATION OF PROJECTIONS:** Introduction	2	24-05-2024		TLM1	
27.	Conversion of Orthographic Projections to Isometric Views of composite objects, Practice	3	30-05-2024		TLM1, 3	
28.	Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	2	31-05-2024		TLM1	
No. of classes required to complete UNIT-V: 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 (R20 Regulation):

Evaluation Task	Marks
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), 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	Dr.K.DILIP KUMAR		
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: Mr. **MrP.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/II/A **A.Y.:**2023-24

Pre-requisites: Physics
Course Educational Objective:

To expose to the field of electrical & electronics engineering, basic principles of electrical electronics engineering and to provide fundamental knowledge in the concerned field

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

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

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

1. R. L. Boylestad & Louis Nashelsky, "Electronic Devices & Circuit Theory, Pearson Education, 2002.
2. B. L. Theraja, Textbook of Electrical Technology, S. Chand & Co. Ltd., 2005

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	13-02-2024		TLM1	
2.	Ohm's Law and its limitations	1	15-02-2024		TLM1	
3.	KCL & KVL	1	16-02-2024		TLM1	
4.	series, parallel, series-parallel circuits	1	16-02-2024		TLM1	
5.	Problems	1	19-02-2024		TLM1	
6.	Super Position theorem	1	20-02-2024		TLM1	
7.	Problems	1	22-02-2024		TLM1	

8.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	23-02-2024		TLM2	
9.	average value, RMS value, form factor, peak factor	1	23-02-2024		TLM1	
10.	RLC Circuits	1	26-02-2024		TLM1	
11.	Impedance, Power	1	27-02-2024		TLM1	
12.	Problems	1	29-02-2024		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.	Construction, principle and operation of (i) DC Motor, (ii) DC Generator.	1	01-03-2024		TLM2	
14.	Single Phase Transformer	1	01-03-2024		TLM2	
15.	Three Phase Induction Motor	1	04-03-2024		TLM2	
16.	Alternator	1	05-03-2024		TLM2	
17.	Applications of electrical machines	1	07-03-2024		TLM2	
18.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	11-03-2024		TLM2	
19.	Moving Iron (MI) Instruments	1	12-03-2024		TLM2	
20.	Wheat Stone bridge	1	14-03-2024		TLM2	
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
21.	Conventional and non-conventional energy resources	1	15-03-2024		TLM2	
22.	Hydel power generation	1	15-03-2024		TLM2	
23.	Nuclear power plant	1	18-03-2024		TLM2	
24.	Solar & Wind power plants	1	19-03-2024		TLM2	
25.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	21-03-2024		TLM2	
26.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	22-03-2024		TLM2	
27.	calculation of electricity bill for domestic consumers.	1	22-03-2024		TLM2	
28.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	26-03-2024		TLM2	
29.	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock	1	28-03-2024		TLM2	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT – IV: SEMICONDUCTOR DEVICES

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

30.	Introduction	1	08-04-2024		TLM1	
31.	Evolution of electronics – Vacuum tubes to nano electronics	1	12-04-2024		TLM2	
32.	PN Junction diode	1	12-04-2024		TLM2	
33.	Characteristics of PN Junction Diode	1	15-04-2024		TLM2	
34.	Zener Effect —	1	16-04-2024		TLM2	
35.	Zener Diode and its Characteristics	1	18-04-2024		TLM2	
36.	Bipolar Junction Transistor	1	19-04-2024		TLM2	
37.	CB Configuration	1	19-04-2024		TLM2	
38.	CE Configuration	1	22-04-2024		TLM2	
39.	CC Configuration	1	23-04-2024		TLM2	
40.	Elementary Treatment of Small Signal CE Amplifier.	1	25-04-2024		TLM2	
No. of classes required to complete UNIT-IV: 11				**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	26-04-2024		TLM1	
42.	Block diagram description of a dc power supply.	1	26-04-2024		TLM1	
43.	working of a full wave bridge rectifier	1	29-04-2024		TLM1	
44.	capacitor filter	1	30-04-2024		TLM1	
45.	working of simple zener voltage regulator	1	02-05-2024		TLM1	
46.	Block diagram of Public Address system	1	03-05-2024		TLM1	
47.	Circuit diagram and working of common emitter (RC coupled) amplifier	1	03-05-2024		TLM1	
48.	Frequency response.	1	06-05-2024		TLM1	
49.	Electronic Instrumentation	1	07-05-2024		TLM1	
50.	Block diagram of an electronic instrumentation system	1	09-05-2024		TLM1	
51.	Revision	1	10-05-2024		TLM1	
No. of classes required to complete UNIT-V: 11				**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.	Overview of Number Systems	1	10-05-2024		TLM2	
55.	Conversion of Number system	1	13-05-2024		TLM2	
56.	Logic gates	1	14-05-2024		TLM1	
57.	BCD & XS-3 code	1	16-05-2024		TLM2	
58.	Gray and Hamming code	1	17-05-2024		TLM1	
59.	Basic theorems	1	17-05-2024		TLM2	
60.	Properties of Boolean Algebra	1	20-05-2024		TLM1	
61.	Logic diagrams using logic gates only	1	21-05-2024		TLM2	
62.	Combinational Vs Sequential circuits	1	23-05-2024		TLM1	

63.	Half adder	1	24-05-2024		TLM1	
64.	Full adder	1	24-05-2024		TLM1	
65.	Introduction to sequential circuits,	1	27-05-2024		TLM1	
66.	Flip flops- SR & D	1	28-05-2024		TLM2	
67.	Flip flops- JK & T	1	30-05-2024		TLM2	
68.	Registers	1	31-05-2024		TLM1	
69.	Counters	1	31-05-2024		TLM1	
No. of classes required to complete UNIT-V: 16				**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
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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	**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	**MrP.SRIHARI**	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
Signature				

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

Part-A

PROGRAM	:	**B.Tech.,I-Sem., CSE-A**
ACADEMICYEAR	:	**2023-24**
COURSENAME &CODE	:	**ENGINEERING PHYSICS LAB**
L-T-PSTRUCTURE	:	**0 – 0 – 2**
COURSECREDITS	:	**1**
COURSEINSTRUCTOR	:	**N. T. SARMA / P.V.SIRISHA**
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 ofradius of curvature of a given Plano - Convex lens by Newton's rings.
2. Determination of wavelengths of diffraction spectral lines in mercury spectrum using diffraction grating in normal incidence configuration.
3. Determination of dielectric constant using charging and discharging method.
4. Determination of wavelength of a laser light using diffraction grating.
5. Magnetic field along the axis of a current carrying circular coil by Stewart Gee's Method.
6. Determination of temperature coefficients of a thermistor.
7. Determination of acceleration due to gravity and radius of Gyration by using a compound pendulum.
8. Determination of Frequency of electrically maintained tuning fork by Melde's experiment.
9. Determination of rigidity modulus of the material of the given wire using Torsional pendulum.
10. Sonometer- Verification of laws of a stretched string.

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

S. No.	Topics to be covered	No. ofClasses Required	TentativeDate ofCompletion	Actual Date ofCompletion	TeachingLearningMethods	LearningOutcomeCOs	TextBookfollowed	HOD Sign
1.	Introduction &Demonstration	3	14/02/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
2.	Experiment1	3	21/02/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
3.	Experiment2	3	28/02/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
4.	Experiment3	3	06/03/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
5.	Experiment4	3	13/03/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
6.	Experiment5	3	20/03/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
7.	Experiment6	3	27/03/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
8.	**MID-1 Exam**	3	03/04/2024		**---**	**---**	**---**	
9.	Experiment 6	3	10/04/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
10.	Experiment 7	3	24/04/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
11.	Experiment 8	3	01/05/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
12.	Experiment 8	3	08/05/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
13.	Experiment 9	3	15/05/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
14.	Experiment 10	3	22/05/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
15.	**Internal Exam**	3	29/05/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	**---**	

16.	**Internal Exam**	3	29/05/2024		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	---	
17.	**MID-2 Exam**	3	05/06/2024		---	---	---	
No.ofclasses required to completelab		14			No.ofclassestaken:			

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.

CourseInstructor **CourseCoordinator** **ModuleCoordinator** **H.O.D**

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem., CSE - A
ACADEMIC YEAR : 2023-24
COURSE NAME & CODE : Differential Equations & Vector Calculus
L-T-P STRUCTURE : 3-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : Dr.A.Rami Reddy
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", 44nd Edition, Khanna Publishers, New Delhi, 2017.
T2 Erwin Kreyszig, *"Advanced Engineering Mathematics"*, 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "*Thomas Calculus*", 14th Edition, Pearson Publishers, 2018.
R2 Dennis G. Zill and Warren S. Jones and Bartlett, "*Advanced Engineering Mathematics*",2018.
R3 Glyn James, "*Advanced Modern Engineering Mathematics*", 5th Edition, Pearson Publishers, 2018.
R4 R.K. Jain and S.R.K. Iyengar, "*Advanced Engineering Mathematics*", 5th Edition (9th reprint),

Alpha Science International Ltd., 2021.

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	12-02-2024		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	13-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	14-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	15-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	17-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	20-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	21-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	22-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	24-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	26-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	27-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	28-02-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	29-02-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	02-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	04-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	05-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	06-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	07-03-2024		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	09-03-2024		TLM1	CO1	T1,T2	

22.	P.I for Cosbx, or sinbx	1	11-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	12-03-2024		TLM1	CO1	T1,T2	
24.	P.I for $e^{ax+b}v(x)$	1	13-03-2024		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	14-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	16-03-2024		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	18-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	19-03-2024		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	20-03-2024		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	21-03-2024		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	23-03-2024		TLM1	CO1	T1,T2	
32.	TUTORIAL - II	1	26-03-2024		TLM3	CO1	T1,T2	
33.	Revision	1	30-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	13-04-2024		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	15-04-2024		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	16-04-2024		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	18-04-2024		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	20-04-2024		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	22-04-2024		TLM1	CO2	T1,T2	
42.	TUTORIAL - III	1	23-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentia

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

44.	Vector Differentiation	1	25-04-2024		TLM1	CO3	T1,T2	
45.	Gradient	1	27-04-2024		TLM1	CO3	T1,T2	
46.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	30-04-2024		TLM1	CO3	T1,T2	
48.	Divergence	1	01-05-2024		TLM1	CO3	T1,T2	
49.	Curl	1	02-05-2024		TLM1	CO3	T1,T2	
50.	Problems	1	04-05-2024		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	07-05-2024		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	08-05-2024		TLM1	CO3	T1,T2	
54.	Vector Identities	1	09-05-2024		TLM1	CO3	T1,T2	
55.	Vector Identities	1	11-05-2024		TLM1	CO3	T1,T2	
56.	TUTORIAL IV	1	13-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
60.	Introduction to Unit-V	1	14-05-2024		TLM1	CO4	T1,T2	
61.	Line Integral	1	15-05-2024		TLM1	CO4	T1,T2	
62.	Circulation	1	16-05-2024		TLM1	CO4	T1,T2	
63.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
64.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
65.	Surface Integral	1	21-05-2024		TLM1	CO4	T1,T2	
66.	Flux	1	22-05-2024		TLM1	CO4	T1,T2	
67.	Green's Theorem	1	23-05-2024		TLM1	CO4	T1,T2	
68.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
69.	Stoke's Thoerem	1	27-05-2024		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	28-05-2024		TLM1	CO4	T1,T2	
71.	TUTORIAL - V	1	29-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

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

II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)			
Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/SwayamPrabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**: I B.Tech., II-Sem., CSE-A**
ACADEMICYEAR	**:2023-24**
COURSENAME &CODE	**: ENGINEERING PHYSICS**
L-T-PSTRUCTURE	**: 3-0-0**
COURSECREDITS	**3**
COURSEINSTRUCTOR	**:N.T.SARMA**
PRE-REQUISITE	**: BasicKnowledgeofPhysics**

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): Atthe end ofthiscourse,thestudentwillbeable to

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

COURSEARTICULATIONMATRIX(CorrelationbetweenCOs,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 "EngineeringPhysics"M.N. Avadhanulu, P.G. Kshirsagar, TVS Arun Murthy, S. Chand & Co., 11th Edition, 2019.
2. EngineeringPhysics – *D.K. Bhattacharya & Poonam Tandon, Oxford press (2015)*

REFERENCES

1. EngineeringPhysics -B.K.Pandey& S. Chaturvedi, Cengage Learning 2021.
2. EngineeringPhysics -Shatendra Sharma, Jyotsna Sharma, Pearson Education, 2018.
3. EngineeringPhysics -Sanjay D. Jain, D. Sahasrabudhe and Girish, University Press 2010.
4. EngineeringPhysics -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	ChalkandTalk	**TLM-4**	Demonstration(Lab/FieldVisit)
TLM-2	PPT/AVillustrations	**TLM-5**	ICT(NPTEL/Swayam Prabha/MOOCS)
TLM-3	Tutorial/Quiz/Assignment	**TLM-6**	GroupDiscussion/Project

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE,DIFFRACTION & POLARIZATION

CourseOutcome :-CO1;TextBook:-T1,R2

S.No.	Topics to becovered	No.of Classes Required	Tentative DateofCompletion	Actual DateofCompletion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction tothe Subject, CourseOutcomes	1	12/02/2024		**TLM-2**		
2.	Principle of superposition, Interference of light	1	13/02/2024		**TLM-3**		

3.	Interference in thin films by reflection & applications	1	14/02/2024		**TLM-2**		
4.	Colors in thin films, Newton's rings	1	16/02/2024		**TLM-1**		
5.	Determination of wavelength and refractive index	1	19/02/2024		**TLM-4**		
6.	Problems& Assignment/Quiz	1	20/02/2024		**TLM-1**		
7.	Introduction, Fresnel and Fraunhoffer diffractions	1	21/02/2024		**TLM-3**		
8.	Fraunhoffer diffraction due to single slit	1	23/02/2024		**TLM-2**		
9.	Double slit& N slits(Qualitative)	1	26/02/2024		**TLM-4**		
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	27/02/2024		**TLM-4**		
11.	Problems& Assignment/Quiz	1	28/02/2024		**TLM-3**		
12.	Introduction – Types of polarization	1	01/03/2024		**TLM-2**		
13.	Polarization by reflection, refraction & double refraction	1	04/03/2024		**TLM-2**		
14.	Nicol's prism	1	05/03/2024		**TLM-5**		
15.	Half wave and Quarter wave plates	1	06/03/2024		**TLM-2**		
16.	Problems& Assignment/Quiz	1	11/03/2024		**TLM-3**		
No.ofclassesrequiredtocomplete UNIT-I:16				No.ofclasses taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

CourseOutcome :-CO2;TextBook:-T1,R2

S.No.	Topics to becovered	No.ofClasses Required	Tentative Dateof Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	12/03/2024		**TLM-3**		

2.	Bravais Lattices Crystal Systems(3D)	1	13/03/2024		**TLM-2**		
3.	Coordination number – Packing fraction of –SC, BCC	1	15/03/2024		**TLM-1**		
4.	Coordination number – Packing fraction of FCC	1	18/03/2024		**TLM-1**		
5.	Miller indices& Properties	1	19/03/2024		**TLM-2**		
6.	Separation between successive (hkl) planes	1	20/03/2024		**TLM-1**		
7.	Bragg's law; X–ray Diffractometer	1	22/03/2024		**TLM-2**		
8.	Crystal Structure determination by Laue's method	1	26/03/2024		**TLM-5**		
9.	Crystal Structure determination by Powdermethod	1	27/03/2024		**TLM-5**		
10.	Problems& Assignment/Quiz	1	27/03/2024		**TLM-3**		
11.	MID-1 Examinations	1	01/04/2024				
12.	MID-1 Examinations	1	02/04/2024		----		
13.	MID-1 Examinations	1	03/04/2024		----		
No.ofclassesrequiredtocomplete UNIT-II: 10				No.ofclasses taken:			

UNIT-III : DIELECTRIC & MAGNETIC MATERIALS

CourseOutcome :-CO 3;TextBook:-T1,R2

S.No	Topics to becovered	No.ofClasses Required	Tentative Dateof Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Basic definitions, Relation between the electric vectors.	1	08/04/2024		**TLM-2**		
2.	Types of polarizations- Electronic polarization	1	10/04/2024		**TLM-1**		
3.	Types of polarizations- ionic & orientation	1	12/04/2024		**TLM-1**		

	polarizations (Qualitative)						
4.	Lorentz internal field	1	15/04/2024		**TLM-2**		
5.	Claussius-Mosotti equation, Complex dielectric constant	1	16/04/2024		**TLM-1**		
6.	Frequency dependence & dielectric loss	1	19/04/2024		**TLM-5**		
7.	Problems& Assignment/Quiz	1	22/04/2024		**TLM-3**		
8.	Basic definitions, Relations&Atomic origin of magnetic Moment.	1	23/04/2024		**TLM-4**		
9.	Classification of magnetic materials-Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	24/04/2024		**TLM-2**		
10.	Domain concept for Ferromagnetism & Domain walls	1	26/04/2024		**TLM-2**		
11.	Hysteresis, soft and hard magnetic materials	1	29/04/2024		**TLM-5**		
12.	Problems& Assignment/Quiz	1	30/04/2024		**TLM-3**		
No.ofclassesrequiredtocomplete UNIT-V:12				No.ofclasses taken:			

UNIT-IV :QUANTUM MECHANICS&FREEELECTRONTHEORY

CourseOutcome :-CO 4;TextBook:-T1,R2

S.No.	Topics to becovered	No.of Classes Required	Tentative DateofCompletion	Actual DateofCompletion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter,De-Broglie's Hypothesis	1	01/05/2024		**TLM-2**		Extrahour
2.	Heisenberg's Uncertainty Principle,Significance & properties of wave function	1	03/05/2024		**TLM-2**		
3.	Schrodinger's time independent and dependent wave equations	1	06/05/2024		**TLM-1**		
4.	Particle in a one – dimensional infinite potential well	1	07/05/2024		**TLM-1**		

5.	Problems& Assignment/Quiz	1	08/05/2024		**TLM-3**		
6.	Classical free electron theory-merits and demerits	1	10/05/2024		**TLM-2**		
8.	Quantum free electron theory Electrical conductivity	1	13/05/2024		**TLM-2**		
10.	Fermi -Dirac distribution and temperature dependence	1	14/05/2024		**TLM-5**		
11.	Density of states, Fermi energy	1	15/05/2024		**TLM-1**		
12.	Problems& Assignment/Quiz	1	17/05/2024		**TLM-3**		
No.ofclasses requiredtocompleteUNIT-III:12				No.ofclasses taken:			

UNIT-V:SEMICONDUCTORPHYSICS

CourseOutcome :-CO 5;TextBook:-T2,R1

S.No.	Topics to becovered	No.ofClasses Required	Tentative Dateof Completion	Actual Dateof Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Formation of energy bands, classification of crystalline solids	1	20/05/2024		**TLM-6**		
2.	Intrinsic semiconductors, Density of charge carriers	1	21/05/2024		**TLM-1**		
3.	Electrical conductivity, Fermi level	1	22/05/2024		**TLM-2**		
4.	Extrinsic semiconductors, Density of charge carriers	1	24/05/2024		**TLM-1**		
5.	Dependence of Fermi energy on carrier concentration &temperature	1	27/05/2024		**TLM-2**		
6.	Drift and Diffusion Currents, Einstein's equation	1	28/05/2024		**TLM-1**		

7.	Hall Effect & its applications	1	29/05/2024		**TLM-4**		
8.	Problems& Assignment/Quiz	1	31/05/2024		**TLM-3**		
9.	MID-2 Examinations	1	03/06/2024		----		
10.	MID-2 Examinations	1	04/06/2024		----		
11.	MID-2 Examinations	1	05/06/2024		----		
12.	MID-2 Examinations	1	07/06/2024		----		
No.ofclassesrequiredtocomplete UNIT-IV:08				No.ofclasses 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
N.T.SARMA	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.A.RAMIREDDY**

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE - B
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K. Jhansi Rani
COURSE COORDINATOR	**:** Dr.
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	3	-	-	-	-	-	-	-	-	-	1
CO2	3	1	-	-	-	-	-	-	-	-	-	1
CO3	3	2	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	13-02-2024		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	14-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	16-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	17-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	20-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	21-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	23-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	24-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	26-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	27-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	28-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	01-03-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	02-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	04-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	05-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	06-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
20.	Finding Particular Integral, P.I for e^{ax+b}	1	12-03-2024		TLM1	CO1	T1,T2	
21.	P.I for Cos bx, or sin bx	1	13-03-2024		TLM1	CO1	T1,T2	
22.	P.I for polynomial function	1	15-03-2024		TLM1	CO1	T1,T2	
23.	P.I for $e^{ax+b}v(x)$	1	16-03-2024		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	18-03-2024		TLM1	CO1	T1,T2	

25.	Method of Variation of parameters	1	19-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	20-03-2024		TLM1	CO1	T1,T2	
27.	Simultaneous linear equations	1	22-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	23-03-2024		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	26-03-2024		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	27-03-2024		TLM1	CO1	T1,T2	
31.	TUTORIAL - II	1	30-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
33.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary functions	1	12-04-2024		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	13-04-2024		TLM1	CO2	T1,T2	
36.	Solving of PDE	1	15-04-2024		TLM1	CO2	T1,T2	
37.	Lagrange's Method	1	16-04-2024		TLM1	CO2	T1,T2	
38.	Lagrange's Method	1	19-04-2024		TLM1	CO2	T1,T2	
39.	Homogeneous Linear PDE with constant coefficients	1	20-04-2024		TLM1	CO2	T1,T2	
40.	TUTORIAL - III	1	22-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector 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
41.	Introduction to UNIT IV	1	23-04-2024		TLM1	CO3	T1,T2	
42.	Vector Differentiation	1	24-04-2024		TLM1	CO3	T1,T2	
43.	Gradient	1	26-04-2024		TLM1	CO3	T1,T2	
44.	Directional Derivative	1	27-04-2024		TLM1	CO3	T1,T2	
45.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
46.	Divergence	1	30-04-2024		TLM1	CO3	T1,T2	

47.	Curl	1	01-05-2024		TLM1	CO3	T1,T2	
48.	Problems	1	03-05-2024		TLM1	CO3	T1,T2	
49.	Solenoidal fields, Irrotational fields, potential surfaces	1	04-05-2024		TLM1	CO3	T1,T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
51.	Laplacian, second order operators	1	07-05-2024		TLM1	CO3	T1,T2	
52.	Vector Identities	1	08-05-2024		TLM1	CO3	T1,T2	
53.	Vector Identities	1	10-05-2024		TLM1	CO3	T1,T2	
54.	TUTORIAL IV	1	13-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	14-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	15-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	17-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	21-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	22-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	24-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	28-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	29-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	2	31-05-2024 01-06-2024		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

Evaluation Task	**Marks**

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

PART-D PROGRAMME OUTCOMES (POs):

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

Dr. K. Jhansi Rani		**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.K.Dilip Kumar Professor
Dr.B.Sudheer Kumar Sr. Assistant Professor (A)

Course Name & Code : Engineering Graphics – 23ME01
L-T-P Structure : 2-0-4 **Credits:** 4
Program/Sem/Sec : CSE /B.Tech/I Sem/B-Section **A.Y.:** 2023-24
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

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, Geometrical Constructions, Practice	1	12-02-2024		TLM3	
2.	Engineering Curves: Conic Sections- Ellipse, Parabola, Hyperbola General methods	4	13-02-2024		TLM1	
3.	Practice	1	19-02-2024		TLM3	
4.	Cycloid, Epicycloid and Practice Hypocycloid; Involutes	4	20-02-2024		TLM1	
5.	Introduction to Orthographic Projections, First and third angle projection methods, Practice Projections of Points	1	26-02-2024		TLM3	
6.	Practice	4	27-02-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
7.	**UNIT-2 PROJECTIONS OF STRAIGHT LINES** Projections of straight lines of different orientations when line is parallel to one and inclined to the other, Practice	1	04-03-2024		TLM3	
8.	Projections of lines when inclined to both the planes	4	05-03-2024		TLM1	
9.	**PROJECTIONS OF PLANES:** Introduction to Projection of Planes	1	11-03-2024		TLM3	
10.	Planes parallel to one of the reference planes, Practice	4	12-03-2024		TLM1	
11.	Inclined to one reference plane and perpendicular to other, Practice	1	18-03-2024		TLM3	
No. of classes required to complete UNIT-II: 11				**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
12.	**UNIT III: Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions:**	4	19-03-2024		TLM1	
13.	**Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane**	4	26-03-2024			
14.	I -MID EXAM		01-04-2024 To 06-04-2024		TLM1, 3	
15.	**Axis parallel to both the reference planes,**	1	08-04-2024		TLM1	
16.	**Projection of Solids with axis inclined to one reference plane and parallel to another plane.**	1	15-04-2024		TLM3	
17.	Practice, Lines	4	16-04-2024		TLM1	
No. of classes required to complete UNIT-III: 14			**No. of classes taken:**			

UNIT-IV: 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.	**UNIT IV: Sections of Solids: Perpendicular and inclined section planes,**	1	22-04-2024		TLM1, 3	
19.	**Sectional views and True shape of section,**	4	23-04-2024		TLM1	
20.	**Sections of solids in simple position only.**	1	29-04-2024		TLM3	
21.	**Development of Surfaces: Methods of Development: Parallel line development and**	4	30-04-2024		TLM1	
22.	**radial line development.**	1	06-05-2024		TLM3	
23.	**Development of a cube, pyramid and cone, cylinder,** Practice	4	07-05-2024		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
24.	**UNIT V: ISOMETRIC VIEWS –** Introduction to Isometric Views, Practice	1	13-05-2024		TLM1, 3	
25.	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes, Practice	4	14-05-2024		TLM1	
26.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing, Practice	1	20-05-2024		TLM3	
27.	**TRANSFORMATION OF PROJECTIONS:** Introduction	4	21-05-2024		TLM1	
28.	Conversion of Orthographic Projections to Isometric Views of composite objects, Practice	1	27-05-2024		TLM1, 3	
29.	Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	4	28-05-2024		TLM1	
No. of classes required to complete UNIT-V: 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 (R20 Regulation):

Evaluation Task	Marks
I-Descriptive Examination (Units-I, II & UNIT-III (Half of the Syllabus))	M1=15
II- Descriptive Examination (UNIT-III (Remaining Half of the Syllabus), 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	Dr.K.DILIP KUMAR		
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., I-Sem., CSE-B**
ACADEMIC YEAR	**: 2023-24**
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 maganetic 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	13/02/2024		**TLM2**		
2.	Superposition of Coherence, Conditions for Interference	1	16/02/2024		**TLM1**		
3.	Interference from thin films, colours in thin films	1	17/02/2024		**TLM1**		
4.	Newton's rings	1	20/02/2024		**TLM2**		

5.	Introduction – Diffraction, Types	1	21/02/2024		**TLM1**		
6.	Single slit diffraction	1	23/02/2024		**TLM2**		
7.	Double slit	1	24/02/2024		**TLM4**		
8.	N Slits Diffraction grating	1	27/02/2024		**TLM4**		
9.	TUTORIAL	1	28/02/2024		**TLM3**		
10.	Dispersive power & Resolving power of Grating	1	01/03/2024		**TLM3**		
11.	Polarization introduction Polarization by reflection, refraction	1	02/03/2024		**TLM1**		
12.	Double refraction, Nicol's prism	1	05/03/2024		**TLM1**		
13.	Half wave and quarter wave plate	1	06/03/2024		**TLM2**		
No. of classes required to complete UNIT-I: 13				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	09/03/2024		**TLM2**		
2.	Bravais Lattices	1	19/03/2024		**TLM1**		
3.	Packing fraction of SC, BCC	1	20/03/2024		**TLM1**		
4.	FCC	1	22/03/2024		**TLM2**		
5.	Miller Indices, separation between (hkl) planes	1	23/03/2024		**TLM2**		
6.	Bragg's law	1	26/03/2024		**TLM1**		
7.	X-ray Diffractometer	1	27/03/2024		**TLM2**		
8.	Laue's method powder method	1	30/03/2024		**TLM2**		
9.	Mid 1		02/04/2024				
10.	Mid 1		03/04/2024				
11.	Mid 1		06/04/2024				
No. of classes required to complete UNIT-II: 11				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	10/04/2024		**TLM1**		
2.	Electronic polarization	1	12/04/2024		**TLM1**		
3.	Ionic & Orientation polarization	1	13/04/2024		**TLM1**		
4.	Local field,	1	16/04/2024		**TLM1**		
5	Clausius Mosotti equation, complex dielectric constant	1	19/04/2024		**TLM2**		
6	Frequency dependence of polarization Dielectric loss and problems	1	20/04/2024		**TLM1**		
7	Introduction to Magnetic parameters origin of magnetic moment	1	23/04/2024		**TLM1**		
8	Classification of magnetic materials – Dia, para & Ferro	1	24/04/2024		**TLM1**		
9	Classification of magnetic materials – Dia, para & Ferro Anti ferro and ferri	1	26/04/2024		**TLM2**		
10	Domain concept of ferromagnetism and domain walls	1	27/04/2024		**TLM2**		
11	Hysteresis curve soft and hard magnetic materials	1	30/04/2024		**TLM1**		
No. of classes required to complete UNIT-III: 11				No. of classes taken:			

UNIT-IV QUANTUM MECHANICS & FREE ELECTRON THEORY

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

		Required	Completion	Completion	Methods		
1.	Introduction quantum mechanics,De Broglie hypothesis	1	01/05/2024		**TLM1**		
2.	Heisenberg uncertainty principle , Physical significance of wave function	1	03/05/2024		**TLM1**		
3.	Schrodinger time dependent & independent wave equations	1	04/05/2024		**TLM1**		
4.	Particle in a box	1	07/05/2024		**TLM1**		
5.	Classical free electron theory-postulates, Success & Failures	1	08/05/2024		**TLM2**		
6.	Quantum free electron theory, electrical conductivity	1	10/05/2024		**TLM1**		
7.	Tutorial	**1**	11/05/2024		**TLM3**		
8.	Fermi-Dirac distribution function-Temperature dependence	**1**	14/05/2024		**TLM2**		
9.	Density of states Fermi energy	**1**	15/05/2024		**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 - Classification of semiconductors	1	17/05/2024		**TLM1**		
2.	Density of Intrinsic and semiconductors Electrons, Holes	1	18/05/2024		**TLM1**		
3.	Density of Intrinsic and semiconductors Holes	1	21/05/2024		**TLM1**		
4.	Electrical conductivity and	1	22/05/2024		**TLM1**		

	fermi level						
5.	Density of Extrinsic semiconductors P-Type		24/05/2024		**TLM2**		
6.	Density of Extrinsic semiconductors N Type		25/05/2024		**TLM1**		
7.	Drift and diffusion currents	1	28/05/2024		**TLM2**		
8.	Einstein equation	1	29/05/2024		**TLM1**		
9.	Hall effect and applications	1	01/06/2024		**TLM1**		
10.	Mid - 2		03/06/2024				
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	**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.

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

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COURSE HANDOUT

Part-A

PROGRAM : B.Tech., II-Sem.,(CSE) / B

ACADEMIC YEAR : 2023-2024

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	15-02-2024		**TLM4**	
2.	Experiment 1	3	22-02-2024		**TLM4**	
3.	Experiment 2	3	29-02-2024		**TLM4**	
4.	Experiment 3	3	07-03-2024		**TLM4**	
5.	Experiment 4	3	21-03-2024		**TLM4**	
6.	MID -1	3	04-04-2024		**TLM4**	
7.	Experiment 5	3	18-04-2024		**TLM4**	
8.	Experiment 6	3	25-04-2024		**TLM4**	
9.	Experiment 7	3	02-05-2024		**TLM4**	
10.	Experiment 8	3	09-05-2024		**TLM4**	
11.	Experiment 9	3	16-05-2024		**TLM4**	
12.	Experiment 10	3	23-05-2024		**TLM4**	
13.	**Internal Exam**	3	30-05-2024		**TLM4**	
	No. of classes required to complete Syllabus:			39		

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):

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.

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

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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 & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /B **A.Y.:** 2023-24

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		
CO2	3	2	2	1									2		
CO3	3	2	2	1									2		
CO4	3	2	2	1									2		
CO5	3	2	2	1									2		
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	14-02-2024		TLM1	
2.	Definition and Importance of Linear Data Structures	1	15-02-2024		TLM1	
3.	Abstract Data Types and Implementation	1	16-02-2024		TLM1	
4.	Overview of time and space complexity	1	17-02-2024		TLM1	
5.	Analysis of Liner Data structures	2	19-02-2024 21-02-2024		TLM1	
6.	Revise Arrays	1	22-02-2024		TLM1	
7.	Searching Techniques: Linear Search	1	23-02-2024		TLM1	
8.	Binary Search & Analysis	2	24-02-2024 26-02-2024		TLM1	
9.	Bubble Sort & Analysis	1	28-02-2024		TLM1	
10.	Insertion Sort & Analysis	2	29-02-2024 04-03-2024		TLM1	
11.	Selection Sort & Analysis	2	06-03-2024 07-03-2024		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	11-03-2024		TLM1	
13.	Linked List Representation	1	13-03-2024		TLM1	
14.	Sing Linked List : Operations	3	14-03-2024 15-03-2024 16-03-2024		TLM1	
15.	Double Linked List : Operations	2	18-03-2024 20-03-2024		TLM1	
16.	Circular Single Linked List	1	21-03-2024		TLM1	
17.	Circular Double Linked List	2	22-03-2024 23-03-2024		TLM1	
18.	Comparing Arrays and Linked List	1	27-03-2024		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	28-03-2024		TLM1	
20.	Polynomial Addition	1	30-03-2024		TLM1	
No. of classes required to complete UNIT-II: 13				**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	08-04-2024		TLM1	

22.	Operations of Stacks	1	10-04-2024		TLM1	
23.	Implementation of stacks using arrays	1	12-04-2024		TLM1	
24.	Stacks using Linked List	1	13-04-2024		TLM1	
25.	Expressions: Expression evaluation	2	15-04-2024 18-04-2024		TLM1	
26.	Infix to Postfix Conversion	2	19-04-2024 20-04-2024		TLM1	
27.	Checking Balanced Parenthesis	2	22-04-2024 24-04-2024		TLM1	
28.	Reversing a List	1	25-04-2024		TLM1	
29.	Backtracking	1	26-04-2024		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	27-04-2024		TLM1	
31.	Implementing queues using arrays	1	29-04-2024		TLM1	
32.	Implementing queues using Linked List	1	01-05-2024		TLM1	
33.	Applications of Queue : Scheduling	1	02-05-2024		TLM1	
34.	Breadth First Search	1	03-05-2024		TLM1	
35.	Circular Queue	2	04-05-2024 06-05-2024		TLM1	
36.	Double ended queue	2	08-05-2024 09-05-2024		TLM1	
37.	Applications of Deque	1	10-05-2024		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	11-05-2024		TLM1	
39.	Representation of Trees	1	13-05-2024		TLM1	
40.	Tree Traversals	1	15-05-2024		TLM1	
41.	Binary Search Trees-Operations	3	16-05-2024 17-05-2024 18-05-2024		TLM1	
42.	Hashing Introduction	1	20-05-2024		TLM1	
43.	Hash Functions	1	22-05-2024		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	23-05-2024		TLM1	
45.	Open Addressing: Linear Probing	1	24-05-2024		TLM1	
46.	Quadratic Probing, Double Hashing	1	25-05-2024		TLM1	
47.	Rehashing	1	30-05-2024		TLM1	
48.	Applications of Hashing	1	01-06-2024		TLM1	
49.					TLM1	
No. of classes required to complete UNIT-V: 13				**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	18-04-2024					
2.	Towers of Hanoi	1	25-04-2024					
3.	Extendable Hashing	1	31-05-2024					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/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 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. S.Nagarjuna 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),
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.
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 LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/B **A.Y.:** 2023-24

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		
CO2	3	2	2	1	3								3		
CO3	3	2	2	1	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	14-02-2024		
2.	Searching and Sorting Techniques	3	21-02-2024		
3.	Single Linked List	3	28-02-2024		
4.	Double Linked List	3	06-03-2024		
5.	Circular Linked List	3	13-03-2024		
6.	Polynomial Representation & Polynomial Addition	3	20-03-2024		
7.	Linked List Applications	3	27-03-2024		
8.	Stack Implementation	3	16-04-2024		
9.	Stack Applications	3	23-04-2024		
10.	Queue Implementation & Circular Queue	3	30-04-2024		
11.	Double Ended Queue	3	07-05-2024		
12.	Trees	3	14-05-2024		
13.	Hashing	3	21-05-2024		
14.	Internal Exam	3	28-05-2024		

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.
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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.
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. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	**Dr. D. Veeraiah**
Signature				

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Phone: 08659-222933, Fax: 08659-222931

Department of Computer science and Engineering

COURSE HANDOUT

PART-A

Name of Course Instructor: CH. MALLIKHARJUNARAO
Course Name & Code **:** BASIC ELECTRICAL & ELECTRONICS ENGINEERING
L-T-P Structure **:3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/II/B **A.Y.:** 2023-2024

PREREQUISITE: Nil

PART A: BASIC ELECTRICAL ENGINEERING

COURSE OBJECTIVES (COs): 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)

PART B: BASIC ELECTRONICS ENGINEERING

COURSE OBJECTIVES (COs):

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

COURSE OUTCOMES (COs): After the completion of the course students will be able to

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
CO1	3	2	3									1			
CO2	2	2													
CO3	2	2				3					2	2			
CO4	3	2										1			
CO5	3	2										1			
CO6	2	2	2												
1 - Low						**2** –Medium						**3** - High			

TEXTBOOKS: PART A: BASIC ELECTRICAL ENGINEERING

T1	1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
T2	2.Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
T3	3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

REFERENCE BOOKS: PART A: BASIC ELECTRICAL ENGINEERING

R1	1.Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition
R2	2. Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020.
R3	3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017
R4	4.Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition

TEXTBOOKS: PART B: BASIC ELECTRONICS ENGINEERING

T1	1.R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education, 2021.
T2	2.R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

REFERENCE BOOKS: PART B: BASIC ELECTRONICS ENGINEERING

R1	1. R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.
R2	2. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.
R3	3R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education,2009

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	Electrical circuit elements (R, L & C)	1	12/2/2024		TLM1	
2	Ohm's Law and its limitations, KCL & KVL	1	13/2/2024		TLM1	
3	series, parallel, series-parallel circuits	1	14/2/2024		TLM1	
4	Super Position theorem	1	15/2/2024		TLM1	
5	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	17/2/2024		TLM1	
6	average value, RMS value	1	19/2/2024		TLM1	
7	form factor, peak factor	1	20/2/2024		TLM1	
8	Voltage and current relationship with phasor diagrams in R, L, and C circuits.	1	21/2/2024		TLM1	
9	Voltage and current relationship with phasor diagrams in R, L, and C circuits.	1	22/2/2024		TLM1	
10	Concept of Impedance, Active power	1	24/2/2024		TLM1	
11	Concept of reactive power and apparent power, Concept of	1	26/2/2024		TLM1	

	power factor					
12	Simple numerical problems	1	27/2/2024		TLM3	
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	Construction, principle and operation of (i) DC Motor	1	28/2/2024		TLM2	
14	Construction, principle and operation of (ii) DC Generator	1	29/2/2024		TLM2	
15	Construction, principle and operation of (ii) DC Generator	1	2/3/2024		TLM2	
16	Single Phase Transformer	1	4/3/2024		TLM2	
17	Three Phase Induction Motor	1	5/3/2024		TLM2	
18	Three Phase Induction Motor	1	6/3/2024		TLM2	
19	Alternator	1	7/3/2024		TLM2	
20	Applications of Electrical machines	1	11/3/2024		TLM2	
21	Construction and working principle of Permanent Magnet Moving coil (PMMC)	1	12/3/2024		TLM2	
22	Moving Iron (MI) Instruments	1	13/3/2024		TLM1	
23	Moving Iron (MI) Instruments	1	14/3/2024		TLM1	
24	Wheat Stone bridge	1	16/3/2024		TLM1	
No. of classes required to complete UNIT-II: 12				**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
25	Conventional and non-conventional energy resources. Layout and operation of various Power Generation systems: Hydel power generation	1	18/3/2024		TLM1	
26	Nuclear power generation	1	19/3/2024		TLM2	
27	Solar power generation	1	20/3/2024		TLM2	
28	Wind power generation.	1	21/3/2024		TLM2	
29	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	23/3/2024		TLM1	
30	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	26/3/2024		TLM1	
31	Calculation of electricity bill for domestic consumers.	1	27/3/2024		TLM1	
32	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits	1	28/3/2024		TLM1	
33	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to	1	30/3/2024		TLM1	

	avoid shock					
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

COURSE DELIVERY PLAN (LESSON PLAN): PART B: BASIC ELECTRONICS ENGINEERING

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
34	Introduction - Evolution of electronics	1	8/4/2024		TLM1	
35	Vacuum tubes to nano electronics	1	10/4/2024		TLM1	
36	Vacuum tubes to nano electronics	1	15/4/2024		TLM1	
37	Characteristics of PN Junction Diode	1	16/4/2024		TLM1	
38	Zener Effect — Zener Diode and its Characteristics	1	18/4/2024		TLM1	
39	Bipolar Junction Transistor -CB Configurations and Characteristics	1	20/4/2024		TLM1	
40	Bipolar Junction Transistor- CE,Configurations and Characteristics	1	22/4/2024		TLM1	
41	Bipolar Junction Transistor- CC Configurations and Characteristics	1	23/4/2024		TLM1	
42	Elementary Treatment of Small Signal CE Amplifier.	1	24/4/2024		TLM1	
43	Elementary Treatment of Small Signal CE Amplifier.	1	25/4/2024		TLM1	
44	Tutorial-1	1	27/4/2024		TLM3	
45	Tutorial-2	1	29/4/2024		TLM3	
No. of classes required to complete UNIT-IV: 12				**No. of classes taken:**		

UNIT-V: Basic Electronic circuits and Instrumentation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46	Rectifiers and power supplies: Block diagram description of a dc power supply	1	30/4/2024		TLM1	
47	working of a full wave bridge rectifier	1	1/5/2024		TLM1	
48	Analysis of Full wave rectifier	1	2/5/2024		TLM1	
49	capacitor filter (no analysis),	1	4/5/2024		TLM1	
50	working of simple zener voltage regulator	1	6/5/2024		TLM1	
51	Amplifiers: Block diagram of Public Address system	1	7/5/2024		TLM1	
52	Circuit diagram and working of common emitter (RC coupled)	1	8/5/2024		TLM1	

	amplifier with its frequency response					
53	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response	1	9/5/2024		TLM1	
54	Electronic Instrumentation: Block diagram of an electronic instrumentation system	1	13/5/2024		TLM1	
55	Tutorial-1	1	14/5/2024		TLM3	
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
56	Overview of Number Systems	1	15/5/5024		TLM1	
57	Overview of Number Systems	1	16/5/5024		TLM1	
58	Logic gates including Universal Gates	1	18/5/5024		TLM1	
59	BCD codes, Excess-3 code,Gray Code	1	20/5/5024		TLM1	
60	Hamming code	1	21/5/5024		TLM1	
61	Boolean Algebra, Basic Theorems	1	22/5/5024		TLM1	
62	Properties of Boolean Algebra	1	23/5/5024		TLM1	
63	Truth Tables and Functionality of Logic Gates – NOT, OR, AND, NOR, NAND, XOR and XNOR	1	25/5/5024		TLM1	
64	Simple combinational circuits– Half Adders.	1	27/5/2024		TLM1	
65	Full Adders.		28/5/2024			
66	Introduction to sequential circuits, Flip flops	1	29/5/2024		TLM1	
67	Registers (Elementary Treatment only)	1	30/5/2024		TLM1	
68	Counters (Elementary Treatment only)	1	1/6/2024		TLM1	
No. of classes required to complete UNIT-VI: 13				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

Evaluation Task	**Marks**

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	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	CH.Mallikharjuna Rao	Dr.T.Satyanarayana	Dr.G.Srinivasulu	Dr.Y.Amarbabu
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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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 Computer science and Engineering

COURSE HANDOUT

Name of Course Instructor : CH.Mallikharjuna Rao,Mrs.B.Rajeswari,

Course Name & Code : Electrical & Electronics Engineering Workshop (23EE51)

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

Program/Sem/Sec : B.Tech., II-Sem., CSE-B A.Y: 2023-24

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): 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 & PSOs):

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

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.	Verification of KCL and KVL	3	19/2/2024			
2.	Verification of Superposition theorem	3	26/2/2024			
3.	Measurement of Resistance using Wheat stone bridge	3	4/3/2024			
4.	Magnetization Characteristics of DC shunt Generator	3	11/3/2024			
5.	Measurement of Power and Power factor using Single-phase wattmeter	3	18/3/2024			
6.	Calculation of Electrical Energy for Domestic Premises	3	8/4/2024			
7.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	15/4/2024			
8.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.	3	22/4/2024			
9.	Implementation of half wave and full wave rectifiers	3	29/4/2024			
10.	Plot Input & Output characteristics of BJT in CE and CB configurations	3	6/5/2024			
11.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	13/5/2024			
12.	Verification of truth table of S-R,J-K & D-Flip-flop using IC's	3	20/5/2024			
13.	Internal Lab Examination	3	27/5/2024			
No. of classes required to complete Lab:36				**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 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.

Course Instructor	Course Coordinator	Module Coordinator	HOD
CH.Mallikharjuna Rao	CH.Mallikharjuna Rao	Dr.G.Srinivasulu	Dr. Y. Amar Babu

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF MECHANICAL ENGINEERING

COURSEHANDOUT

PROGRAM : B. Tech. II-Sem., CSE–B Section

ACADEMICYEAR : 2023-24

COURSE NAME & CODE : Engineering Workshop, 23ME51

PSTRUCTURE :0-0-3

COURSECREDITS :1.5

COURSE INSTRUCTOR :Mr K Lakshmi Prasad/Miss P Mounika

COURSE COORDINATOR : Seelam Srinivasa Reddy

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

COURSEOBJECTIVE: To familiarize students with wood working, sheet metal operations, fitting, electrical house wiring skills, and basic repairs of two-wheeler vehicle.

COURSE OUTCOMES (CO)

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

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
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).

Textbooks:

1. Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published,2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.
2. A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai &Co., 2015 & 2017.

Reference Books:

1. Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition
2. Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.
3. Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakashan, 2021-22

COURSE DELIVERY PLAN (LESSONPLAN): Section-B

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1	Demonstration	3	16.02.2024		TLM8		
2	Experiment-1	3	23.02.2024		TLM8		
3	Experiment-2	3	01.03.2024		TLM8		
4	Experiment-3	3	15.03.2024		TLM8		
5	Experiment-4	3	22.03.2024		TLM8		
MID-1 EXAM 01.04.2024 to 06.04.2024							
6	Experiment-5	3	12.04.2024		TLM8		
7	Experiment-6	3	19.04.2024		TLM8		
8	Experiment-7	3	26.04.2024				
9.	Experiment-8	3	03.05.2024		TLM8		
10.	Demonstration of Forging	3	10.05.2024		TLM8		
11.	Demonstration of Tin Smithy	3	17.05.2024		TLM8		
12.	Repetition	3	24.05.2024		TLM8		
13.	Lab Internal	3	31.05.2024		TLM8		

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 PhaseofInstructions-1	12.02.2024	06.04.2024	8W
I Mid Examinations	01.04.2024	06.04.2024	1W
II Phase of Instructions	08.04.2024	01.06.2024	8W
II Mid Examinations	03.06.2024	08.06.2024	1W
Preparation and Practical	10.06.2024	15.06.2024	1W
Semester End Examinations	17.06.2024	29.06.2024	2W

EVALUATIONPROCESS:

Part-C

Parameter		Marks
Day–to–Day Work	Observation & Record	A1=10Marks
	Viva	A2=05Marks
Internal Test		B=15Marks
Cumulative Internal Examination		A1+A2+B=30 Marks
Semester End Examinations		D=70Marks
TotalMarks:A1+A2+B+C+D		100Marks

Details of Batches: C-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
C1	23761A0501-517	17	**C2**	23761A0535-550	16
C2	23761A0518-534	17	**C4**	23761A0551-566	16

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
C1	F1	F2	C1	C2	E1	E2	P1	P2	D1	D2
C2	C1	C2	E1	E2	P1	P2	F1	F2	D1	D2
C3	E1	E2	P1	P2	F1	F2	C1	C2	D1	D2
C4	P1	P2	F1	F2	C1	C2	E1	E2	D1	D2

LISTOF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO2
2.	Carpentry-2(C2)-Dovetail Joint	CO2
3.	Fitting-1(F1)-T-Joint	CO3
4.	Fitting-2(F2)-V-Joint	CO3
5.	Plumbing-1(P1)-Pipe Threading practice	CO2
6.	Plumbing-2(P2)-Pipe Layout	CO2
7.	HouseWiring-1(E1)–Series and Parallel connection	CO4
8.	HouseWiring-2(E2)–Fluorescent Lamp and Calling Bell Circuit	CO4
9.	Black Smithy(D1)	CO2
10.	Tin Smithy(D2)	CO2

NOTIFICATIONOFCYCLE

Cycle	Exp. No	Name of the Experiment	Related CO
Cycle-1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO2
	2.	Carpentry-2(C2)-Dovetail Joint	CO2
	3.	Fitting-1(F1)-T-Joint	CO3
	4.	Fitting-2(F2)-V-Joint	CO3
	5.	Plumbing-1(P1)-Pipe Threading practice	CO2
	6.	Plumbing-2(P2)-Pipe Layout	CO2
	7.	HouseWiring-1(E1)–Series and Parallel Connection	CO4
	8.	HouseWiring-2(E2)–Fluorescent Lamp and Calling bell Circuit	CO4
Cycle-2	9.	Black Smithy(D1)	CO2
	10.	Tin Smithy(D2)	CO2

PROGRAMMEEDUCATIONALOBJECTIVES:

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 tobecome successful in multidisciplinary activities.

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

PROGRAM OUTCOMES(POs)

Engineering Graduates will be able to:

1. **Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
2. **Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
3. **Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
4. **Conduct investigations of complex problems:** Use research-based knowledge and 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 a n d sustainability:** Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
9. **Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
10. **Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
11. **Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
12. **Life-long learning:** Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

1. **PSO1:** To apply the principles of thermal sciences to design and develop various thermal systems.
2. **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.
3. **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.

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
K Lakshmi Prasad/ P Mounika	**S. Srinivasa Reddy**	**Dr. M B S Sreekar Reddy**	**Dr. M B S SreekarReddy**

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

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

ACADEMIC YEAR : 2023-2024

COURSE NAME & CODE : Engineering Physics-23FE04

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

COURSE CREDITS : 3

COURSE INSTRUCTOR : **Dr. S. YUSUB**

COURSE COORDINATOR : **Dr. S. YUSUB**

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	12-02-2024		TLM1	CO1	T1	
2.	Principle of superposition	1	13-02-2024		TLM1	CO1	T1	
3.	Interference of light, Interference in thin films by reflection reflection & applications	1	14-02-2024		TLM2	CO1	T1	
4.	colors in thin films	1	17-02-2024		TLM1	CO1	T1	
5.	Newton's rings	1	19-02-2024		TLM1	CO1	T1	
6.	ination of wavelength active index.	1	20-02-2024		TLM1	CO1	T1	
7.	DIFFRACTION: Introduction,	1	21-02-2024		TLM1	CO1	T1	
8.	Fresnel and Fraunhoffer diffractions	1	24-02-2024		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	26-02-2024		TLM1	CO1	T1	
10.	double slit & N slits (Qualitative)	1	27-02-2024		TLM1	CO1	T1	
11.	Diffraction Grating, Dispersive power	1	28-02-2024		TLM2	CO1	T1	
12.	Resolving power of Grating(Qualitative)	1	02-03-2024		TLM1	CO1	T1	
13.	Polarization : Introduction	1	04-03-2024		TLM1	CO1	T1	
14.	Types of polarization	1	05-03-2024		TLM1	CO1	T1	
15.	Polarization by reflection	1	06-03-2024		TLM1	CO1	T1	
16.	refraction & double refraction	1	09-03-2024		TLM2	CO1	T1	
17.	Nicol's prism	1	11-03-2024		TLM1	CO1	T1	
18.	half wave and quarter wave plates	1	12-03-2024		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	13-03-2024		TLM1	CO2	T1	
20	Lattice parameters, Bravais Lattices	1	16-03-2024		TLM2	CO2	T1	
21	Crystal Systems (3D)- Coordination number, Packing fraction of -SC	1	18-03-2024		TLM1	CO2	T1	
22	BCC, FCC	1	19-03-2024		TLM1	CO2	T1	
23	ndices, separation between ve (hkl) planes.	1	20-03-2024		TLM2	CO2	T1	
24	X–ray diffraction: Bragg's law; X–ray Diffractometer,	1	26-03-2024		TLM1	CO2	T1	
25	Structure determination by yder methods.	1	27-03-2024		TLM1	CO2	T1	

26	Revision	1	30-03-2024		TLM1	CO1, CO2		
27	**I MID**	**1.5**	**01-04-2024**			**CO1, CO2,**		
28	**I MID**	**1.5**	**02-04-2024**			**CO1, CO2,**		
29	**I MID**	**1.5**	**03-04-2024**			**CO1, CO2,**		
30	**I MID**	**1.5**	**04-04-2024**			**CO1, CO2,**		
31	**I MID**	**1.5**	**05-04-2024**			**CO1, CO2,**		
32	**I MID**	**1.5**	**06-04-2024**			**CO1, CO2,**		
No. of classes required to complete UNIT-II		16		No. of classes taken: 15				

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
33.	DIELECTRIC MATERIALS: Introduction	1	08-04-2024		TLM1	CO3	T1	
34.	Dielectric polarization- Dielectric polarizability, Susceptibility, Dielectric constant & Displacement Vector	1	10-04-2024		TLM2	CO3	T1	
35.	Relation between the electric vectors	1	13-04-2024		TLM1	CO3	T1	
36.	Types of polarizations- Electronic (Quantitative), ionic (Quantitative) & orientation polarizations (Qualitative)	1	15-04-2024		TLM2	CO3	T1	
37.	Lorentz internal field	1	16-04-2024		TLM1	CO3	T1	

38.	Claussius-Mosotti equation	1	20-04-2024		TLM2	CO3	T1	
39.	ex dielectric constant – cy dependence of polariz tric loss.	1	22-04-2024		TLM1	CO3	T1	
40.	MAGNETIC MATERIALS : Introduction:	1	23-04-2024		TLM2	CO3	T1	
41.	Magnetic dipole moment – Magnetization- Magnetic susceptibility & permeability	1	24-04-2024		TLM2	CO3	T1	
42.	Atomic origin of magnetism	1	27-04-2024		TLM2	CO3	T1	
43.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	29-04-2024		TLM1	CO3	T1	
44.	Domain concept for Ferromagnetism & Domain walls	1	30-04-2024		TLM2	CO3	T1	
45.	Hysteresis – soft and hard magnetic materials	1	01-05-2024		TLM2	CO3	T1	
No. of classes required to complete UNIT-IV		14			No. of classes taken: 14			

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
46.	QUANTUM MECHANICS: Dual nature of matter- Heisenberg's Uncertainty Principle	1	04-05-2024		TLM1	CO4	T1	
47.	significance & properties of wave function	1	06-05-2024		TLM2	CO4	T1	
48.	Schrodinger's time independent and dependent wave equations	1	07-05-2024		TLM2	CO4	T1	
49.	in a one –dimensional i l well.	1	08-05-2024		TLM1	CO4	T1	

50.	FREE ELECTRON THEORY: Classical free electron theory (Qualitative with discussion of merits and demerits)	1	11-05-2024		TLM2	CO4	T1	
51.	Quantum free electron theory	1	13-05-2024		TLM1	CO4	T1	
52.	electrical conductivity based on quantum free electron theory	1	14-05-2024		TLM2	CO4	T1	
53.	Fermi -Dirac distribution	1	15-05-2024		TLM2	CO4	T1	
54.	Density of states – Fermi energy	1	18-05-2024		TLM1	CO4	T1	
	V: SEMI CONDUCTORS							
55.	SEMI CONDUCTORS: Formation of energy bands	1	20-05-2024		TLM2	CO5	T1	
56.	classification of crystalline solids- Intrinsic semiconductors	1	21-05-2024		TLM1	CO5	T1	
57.	Density of charge carriers- Electrical conductivity- Fermi level -Extrinsic semiconductors	1	22-05-2024		TLM1	CO5	T1	
58.	Density of charge carriers	1	25-05-2024		TLM1	CO5	T1	
59.	dependence of Fermi energy on carrier concentration and temperature	1	27-05-2024		TLM1	CO5	T1	
60.	Drift and Diffusion Currents	1	28-05-2024		TLM1	CO5	T1	
61.	Einstein's equation	1	29-05-2024		TLM2	CO5	T1	
62.	ect & its applications.	1	01-06-2024		TLM1	CO5	T1	

No. of classes required to complete UNIT-V		7			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
63.	SEM	1	30-05-2024		TLM1		R1	
64.	Conventional energy sources	1	01-06-2024		TLM1		R1	
75	Mid II	1	03-06-2024			CO3, CO4, CO5		
76	Mid II	1	04-06-2024			CO3, CO4, CO5		
77	Mid II	1	05-06-2024			CO3, CO4, CO5		
78	Mid II	1	06-06-2024			CO3, CO4, CO5		
79	Mid II	1	06-06-2024			CO3, CO4, CO5		
80	Mid II	1	08-06-2024			CO3, CO4, CO5		
81	Preparation and Practicals	10-06-2024 to 15-06-2024						
82	Semester end examinations	17-06-2024to 29-06-2024						

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:

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. YUSUB	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),
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., I-Sem., CSE-C
ACADEMIC YEAR	**:**	2023-2024
COURSE NAME & CODE	**:**	ENGINEERING PHYSICS LAB & 23FE53
L-T-P STRUCTURE	**:**	0-0-2
COURSE CREDITS	**:**	1
COURSE INSTRUCTOR	**:**	**Dr. S. YUSUB/MRS. P.V. SIRISHA**
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 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.	Experiment 1	3	13-02-2024		**TLM4**	1,2,3,4	T1	
2.	Experiment 2	3	20-02-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
3.	Experiment 3	3	27-02-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
4.	Experiment 4	3	05-03-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
5.	Experiment 5	3	12-03-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
6.	Experiment 6	3	19-03-2024		**TLM4**	CO1, CO2, CO3, CO4	T1	
7.	Experiment 7	3	26-03-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
8.	Demonstration	3	16-04-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
9.	Experiment 8	3	23-04-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
10.	Experiment 9	3	30-04-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
11.	Experiment 10	3	07-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
12.	Internal examination	3	14-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	

13.	Experiment 10	3	21-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
14.	**Internal Exam**	3	28-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
No. of classes required to complete UNIT-I		42			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. YUSUB / Mrs. P.V. Shirisha	Dr. S. YUSUB	Dr. S. YUSUB	Dr A. RAMI REDDY

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. K.NAGALINGA CHARY
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/C **A.Y.:** 2023-24

Pre-requisites: Physics
Course Educational Objective:

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

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

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

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

Textbooks:

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DC & AC CIRCUITS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Electrical circuit elements	1	12-02-2024		TLM1	
2.	Ohm's Law and its limitations	1	14-02-2024		TLM1	
3.	KCL & KVL	1	15-02-2024		TLM1	
4.	series, parallel, series-parallel circuits	1	16-02-2024		TLM1	
5.	Problems	1	17-02-2024		TLM1	
6.	Super Position theorem	1	19-02-2024		TLM1	
7.	Problems	1	21-02-2024		TLM1	
8.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	22-02-2024		TLM2	
9.	average value, RMS value, form factor, peak factor	1	23-02-2024		TLM1	
10.	RLC Circuits	1	24-02-2024		TLM1	
11.	Impedance, Power	1	26-02-2024		TLM1	
12.	Problems	1	28-02-2024		TLM1	
13.	Problems	1	29-02-2024		TLM1	
No. of classes required to complete UNIT-I: 13				**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
14.	Construction, principle and operation of (i) DC Motor, (ii) DC Generator.	1	01-03-2024		TLM2	
15.	Single Phase Transformer	1	02-03-2024		TLM2	
16.	Three Phase Induction Motor	1	04-03-2024		TLM2	
17.	Alternator	1	06-03-2024		TLM2	
18.	Applications of electrical machines	1	07-03-2024		TLM2	
19.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	09-03-2024		TLM2	
20.	Moving Iron (MI) Instruments	1	11-03-2024		TLM2	
21.	Wheat Stone bridge	1	13-03-2024		TLM2	
22.	Problems	1	14-03-2024		TLM2	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Conventional and non-conventional energy resources	1	15-03-2024		TLM2	
24.	Hydel power generation	1	16-03-2024		TLM2	
25.	Nuclear power plant	1	18-03-2024		TLM2	
26.	Solar & Wind power plants	1	20-03-2024		TLM2	
27.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	21-03-2024		TLM2	

28.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	22-03-2024		TLM2	
29.	calculation of electricity bill for domestic consumers.	1	23-03-2024		TLM2	
30.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	27-03-2024		TLM2	
31.	Personal safety measures: Electric Shock	1	28-03-2024		TLM2	
32.	Earthing and its types	1	30-03-2024		TLM2	
33.	Safety Precautions to avoid shock.	1	30-03-2024		TLM2	
No. of classes required to complete UNIT-III: 11				**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
34.	Introduction	1	08-04-2024		TLM1	
35.	Evolution of electronics – Vacuum tubes to nano electronics	1	10-04-2024		TLM2	
36.	PN Junction diode	1	12-04-2024		TLM2	
37.	Characteristics of PN Junction Diode	1	13-04-2024		TLM2	
38.	Zener Effect — Zener Diode and its Characteristics	1	15-04-2024		TLM2	
39.	Bipolar Junction Transistor	1	18-04-2024		TLM2	
40.	CB Configuration	1	19-04-2024		TLM2	
41.	CE Configuration	1	20-04-2024		TLM2	
42.	CC Configuration	1	22-04-2024		TLM2	
43.	Elementary Treatment of Small Signal CE Amplifier.	1	24-04-2024		TLM2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT – V: BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Introduction	1	25-04-2024		TLM1	
45.	Block diagram description of a dc power supply.	1	26-04-2024		TLM1	
46.	working of a full wave bridge rectifier	1	27-04-2024		TLM1	
47.	capacitor filter	1	29-04-2024		TLM1	
48.	working of simple zener voltage regulator	1	01-05-2024		TLM1	
49.	Block diagram of Public Address system	1	02-05-2024		TLM1	
50.	Circuit diagram and working of common emitter (RC coupled) amplifier	1	03-05-2024		TLM1	
51.	Frequency response.	1	04-05-2024		TLM1	
52.	Electronic Instrumentation	1	06-05-2024		TLM1	
53.	Block diagram of an electronic instrumentation system	1	08-05-2024		TLM1	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

UNIT – VI: DIGITAL ELECTRONICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54.	Overview of Number Systems	1	09-05-2024		TLM2	
55.	Conversion of Number system	1	10-05-2024		TLM2	
56.	Logic gates	1	11-05-2024		TLM1	
57.	BCD & XS-3 code	1	13-05-2024		TLM2	
58.	Gray and Hamming code	1	15-05-2024		TLM1	
59.	Basic theorems	1	16-05-2024		TLM2	
60.	Properties of Boolean Algebra	1	17-05-2024		TLM1	
61.	Logic diagrams using logic gates only	1	18-05-2024		TLM2	
62.	Combinational Vs Sequential circuits	1	20-05-2024		TLM1	
63.	Half adder	1	22-05-2024		TLM1	
64.	Full adder	1	23-05-2024		TLM1	
65.	Introduction to sequential circuits,	1	24-05-2024		TLM1	
66.	Flip flops- SR & D	1	25-05-2024		TLM2	
67.	Flip flops- JK & T	1	27-05-2024		TLM2	
68.	Registers	1	29-05-2024		TLM1	
69.	Counters	2	30-05-2024 31-05-2024		TLM1	
70.	Content Beyond Syllabus	1	01-06-2024		TLM1	
No. of classes required to complete UNIT-V: 16				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 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	**Mr.K.NAGALINGA CHARY**	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
Signature				

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.K.Nagalinga Chary/Mr. A.V. Ravikumar / Mr. R.Anjaneyulu Naik/ Mrs. T.Himabindu

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/C **A.Y.:** 2023-24

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

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

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

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

DAY : WEDNESDAY

Batches: **23761A05D3 To 23761A05J8**

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week
	Tentative date	14/02	21/02	28/02	06/03	13/03	20/03	27/03	10/04	24/05	01/05	08/05	15/05	22/05	29/05
	Actual date														
B-1	23761A05D3 TO 23761A05J8	1	2	3	4	5,6	INTERNAL EXAM-I	7	8	9	10	11	12	REVISION OF EXPERIMENTS	INTERNAL EXAM-II
B-2		1	2	3	4	5,6		7	8	9	10	11	12		
B-3		1	2	3	4	5,6		7	8	9	10	11	12		
B-4		1	2	3	4	5,6		7	8	9	10	11	12		
B-5		1	2	3	4	5,6		7	8	9	10	11	12		
B-6		1	2	3	4	5,6		7	8	9	10	11	12		
B-7		1	2	3	4	5,6		7	8	9	10	11	12		
B-8		1	2	3	4	5,6		7	8	9	10	11	12		
B-9		1	2	3	4	5,6		7	8	9	10	11	12		
B-10		1	2	3	4	5,6		7	8	9	10	11	12		

PART-C

EVALUATION PROCESS (R23 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

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Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.K.NAGALINGA CHARY**	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.J.S.V.PRASAD**
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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE-C
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.
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	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	13-02-2024		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	14-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	15-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	17-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	20-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	21-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	22-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	24-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	26-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	27-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	28-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	29-02-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	01-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	02-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	04-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	05-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	6-03-2024		TLM1	CO1	T1,T2	
20.	Finding Particular Integral, P.I for e^{ax+b}	1	7-03-2024		TLM1	CO1	T1,T2	
21.	P.I for Cos bx, or sin bx	1	11-03-2024		TLM1	CO1	T1,T2	
22.	P.I for polynomial function	1	12-03-2024		TLM1	CO1	T1,T2	
23.	P.I for $e^{ax+b}v(x)$	1	13-03-2024		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	14-03-2024		TLM1	CO1	T1,T2	

25.	Method of Variation of parameters	1	16-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	18-03-2024		TLM1	CO1	T1,T2	
27.	Simultaneous linear equations	1	19-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	20-03-2024		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	21-03-2024		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	23-03-2024		TLM1	CO1	T1,T2	
31.	TUTORIAL - II	1	26-03-2024		TLM3	CO1	T1,T2	
32.	Revision on Unit-2	1	27-03-2024		TLM1	CO1	T1,T2	
33.	Revision on Unit-1	1	28-03-2024		TLM1	CO1	T1,T2	
34.	Revision on Unit-1	1	30-03-2024		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		17			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
35.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	13-04-2024		TLM1	CO2	T1,T2	
38.	Formation of PDE by elimination of arbitrary functions	1	15-04-2024		TLM1	CO2	T1,T2	
39.	Solving of PDE	1	16-04-2024		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	18-04-2024		TLM1	CO2	T1,T2	
41.	Lagrange's Method	1	20-04-2024		TLM1	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	22-04-2024		TLM1	CO2	T1,T2	
43.	TUTORIAL - III	1	23-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	24-04-2024		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	25-04-2024		TLM1	CO3	T1,T2	
46.	Gradient	1	27-04-2024		TLM1	CO3	T1,T2	

47.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	30-04-2024		TLM1	CO3	T1,T2	
49.	Divergence	1	01-05-2024		TLM1	CO3	T1,T2	
50.	Curl	1	02-05-2024		TLM1	CO3	T1,T2	
51.	Problems	1	04-05-2024		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	07-05-2024		TLM1	CO3	T1,T2	
54.	Laplacian, second order operators	1	08-05-2024		TLM1	CO3	T1,T2	
55.	Vector Identities	1	09-05-2024		TLM1	CO3	T1,T2	
56.	Vector Identities	1	11-05-2024		TLM1	CO3	T1,T2	
57.	TUTORIAL IV	1	13-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	14-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	15-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	16-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	21-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	22-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	23-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	28-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	29-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

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

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
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Dr. M.Srinivasa Reddy		**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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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 /C **A.Y.:** 2023-24

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		
CO2	3	2	2	1									2		
CO3	3	2	2	1									2		
CO4	3	2	2	1									2		
CO5	3	2	2	1									2		
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	14-02-2024		TLM1	
2.	Definition and Importance of Linear Data Structures	1	15-02-2024		TLM1	
3.	Abstract Data Types and Implementation	1	16-02-2024		TLM1	
4.	Overview of time and space complexity	1	17-02-2024		TLM1	
5.	Analysis of Liner Data structures	2	19-02-2024 21-02-2024		TLM1	
6.	Revise Arrays	1	22-02-2024		TLM1	
7.	Searching Techniques: Linear Search	1	23-02-2024		TLM1	
8.	Binary Search & Analysis	2	24-02-2024 26-02-2024		TLM1	
9.	Bubble Sort & Analysis	1	28-02-2024		TLM1	
10.	Insertion Sort & Analysis	2	29-02-2024 04-03-2024		TLM1	
11.	Selection Sort & Analysis	2	06-03-2024 07-03-2024		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	11-03-2024		TLM1	
13.	Linked List Representation	1	13-03-2024		TLM1	
14.	Sing Linked List : Operations	3	14-03-2024 15-03-2024 16-03-2024		TLM1	
15.	Double Linked List : Operations	2	18-03-2024 20-03-2024		TLM1	
16.	Circular Single Linked List	1	21-03-2024		TLM1	
17.	Circular Double Linked List	2	22-03-2024 23-03-2024		TLM1	
18.	Comparing Arrays and Linked List	1	27-03-2024		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	28-03-2024		TLM1	
20.	Polynomial Addition	1	30-03-2024		TLM1	
No. of classes required to complete UNIT-II: 13				**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	08-04-2024		TLM1	

22.	Operations of Stacks	1	10-04-2024		TLM1	
23.	Implementation of stacks using arrays	1	12-04-2024		TLM1	
24.	Stacks using Linked List	1	13-04-2024		TLM1	
25.	Expressions: Expression evaluation	2	15-04-2024 18-04-2024		TLM1	
26.	Infix to Postfix Conversion	2	19-04-2024 20-04-2024		TLM1	
27.	Checking Balanced Parenthesis	2	22-04-2024 24-04-2024		TLM1	
28.	Reversing a List	1	25-04-2024		TLM1	
29.	Backtracking	1	26-04-2024		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	27-04-2024		TLM1	
31.	Implementing queues using arrays	1	29-04-2024		TLM1	
32.	Implementing queues using Linked List	1	01-05-2024		TLM1	
33.	Applications of Queue : Scheduling	1	02-05-2024		TLM1	
34.	Breadth First Search	1	03-05-2024		TLM1	
35.	Circular Queue	2	04-05-2024 06-05-2024		TLM1	
36.	Double ended queue	2	08-05-2024 09-05-2024		TLM1	
37.	Applications of Deque	1	10-05-2024		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	11-05-2024		TLM1	
39.	Representation of Trees	1	13-05-2024		TLM1	
40.	Tree Traversals	1	15-05-2024		TLM1	
41.	Binary Search Trees-Operations	3	16-05-2024 17-05-2024 18-05-2024		TLM1	
42.	Hashing Introduction	1	20-05-2024		TLM1	
43.	Hash Functions	1	22-05-2024		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	23-05-2024		TLM1	
45.	Open Addressing: Linear Probing	1	24-05-2024		TLM1	
46.	Quadratic Probing, Double Hashing	1	25-05-2024		TLM1	
47.	Rehashing	1	30-05-2024		TLM1	
48.	Applications of Hashing	1	01-06-2024		TLM1	
49.					TLM1	
No. of classes required to complete UNIT-V: 13				**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	18-04-2024					
2.	Towers of Hanoi	1	25-04-2024					
3.	Extendable Hashing	1	31-05-2024					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/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 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. S.Nagarjuna 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),
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 LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/C **A.Y.:** 2023-24

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		
CO2	3	2	2	1	3								3		
CO3	3	2	2	1	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	14-02-2024		
2.	Searching and Sorting Techniques	3	21-02-2024		
3.	Single Linked List	3	28-02-2024		
4.	Double Linked List	3	06-03-2024		
5.	Circular Linked List	3	13-03-2024		
6.	Polynomial Representation & Polynomial Addition	3	20-03-2024		
7.	Linked List Applications	3	27-03-2024		
8.	Stack Implementation	3	16-04-2024		
9.	Stack Applications	3	23-04-2024		
10.	Queue Implementation & Circular Queue	3	30-04-2024		
11.	Double Ended Queue	3	07-05-2024		
12.	Trees	3	14-05-2024		
13.	Hashing	3	21-05-2024		
14.	Internal Exam	3	28-05-2024		

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.Govindu	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	Dr. D. Veeraiah
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-C Section **A.Y.:** 2023-24
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	2	12-02-2024		TLM2	
2.	Engineering Graphicsand their significance, Drawing Instruments and their use, **Scales:** Plain scales, diagonal scales and vernier scales.	2	12-02-2024		TLM1/ TLM2	
3.	**Curves:** Construction of ellipse, parabola and hyperbola by general method	1	17-02-2024		TLM1	
4.	Construction of parabola and hyperbola by general method, practice	4	19-02-2024		TLM3	
5.	Cycloid, Epicycloid, Hypocycloid	1	24-02-2024		TLM1	
6.	Practice, Involutes	2	26-02-2024		TLM3	
7.	**Orthographic Projections**: Reference plane	1	02-03-2024		TLM1	
8.	Projections of a point situated in any one of the four quadrants.	1	04-03-2024		TLM3	
9.	Projections of a point, practice	3	04-03-2024		TLM1	
10.	Practice	1	11-03-2024		TLM1	
No. of classes required to complete UNIT-I: 18 (Lecture:08, Practice: 10)				**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
11	Introduction to Projections, First and third angle projection methods	1	18-03-2024		TLM1	
12.	Practice	3	18-03-2024		TLM1	
13.	Projections of straight lines parallel to both reference planes	1	23-03-2024		TLM1	
14.	Projections of straight lines perpendicular to one reference plane and parallel to other reference plane	1	30-03-2024		TLM3	
15.	Projections of straight lines inclined to one reference plane and parallel to the other reference plane, practice	3	08-04-2024		TLM1	

16.	Projections of straight lines inclined to one reference plane and parallel to the other reference plane	1	08-04-2024		TLM3	
17.	**Projections of Planes:** Regular planes Perpendicular to both reference planes	1	15-04-2024		TLM1	
18.	parallel to one reference plane and inclined to the other reference plane; Plane inclined to both the reference planes	3	15-04-2024		TLM1	
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
19.	**UNIT III: PROJECTIONS OF SOLIDS:** Introduction, Types of solids: Polyhedra and Solids of revolution	1	15-04-2024		TLM1	
20	Projections of solids in simple positions: Axis perpendicular to horizontal plane	1	20-04-2024		TLM3	
21.	Practice	3	22-04-2024		TLM3	
22.	Axis perpendicular to vertical plane and Axis parallel to both the reference planes	1	22-04-2024		TLM1	
23.	Projection of Solids with axis inclined to one reference plane and parallel to another plane	2	27-04-2024		TLM3	
24.	Practice	2	27-04-2024		TLM1	
No. of classes required to complete UNIT-III: 13 (Lecture: 05 Practice: 08)				**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	Teach ing Learning Methods	HOD Sign Weekly
25.	Perpendicular and inclined section planes	1	29-04-2024		TLM1	
26.	Practice	3	29-04-2024		TLM3	
27.	Sectional views and True shape of section	1	29-04-2024		TLM1	
28.	Sections of solids in simple position only	1	04-05-2024		TLM1	
29.	Practice	3	04		TLM3	
30	**Development of Surfaces:** Methods of Development, Parallel line development and radial line development	1	06-05-2024		TLM2	

31.	Development of a cube, prism, cylinder ,	1	18-05-2024		TLM3	
32	Development of a pyramid and cone	3	18-05-2024		TLM1	
No. of classes required to complete UNIT-IV: 14 (Lecture: 05 Practice: 09)				**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
33.	Introduction to isometric & orthographic views	2	20-05-2024		TLM1	
34.	Practice	2	20-05-2024		TLM1	
35.	Conversion of isometric views to orthographic views	1	25-05-2024		TLM3	
36.	Conversion of orthographic views to isometric views	1	27-05-2024		TLM1	
37.	Practice	3	27-05-2024		TLM3	
38.	**Computer graphics:** Creating 2D&3D drawings of objects including PCB and Transformations using Auto CAD	1	01-06-2024		TLM2	
No. of classes required to complete UNIT-V: 10 (Lecture:05 Practice: 05)				**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 S Reddy
Signature				

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : **B.Tech. I-Sem, CSE-C Section**

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Dr. V.Dhana Raju, Assoc. Professor,
Ms. P. Mounika, 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.	Induction Programme	3	16-02-2024		TLM8	R1	
2.	Demonstration	3	23-02-2024		TLM8	R1	
3.	Experiment-1	3	01-03-2024		TLM8	R1	
4.	Experiment-2	3	15-03-2024		TLM8	R1	
5.	Experiment-3	3	22-03-2024		TLM8	R1	
I-Mid Examinations (01-04-2024 to 06-04-2024)							
6.	Experiment-4	3	12-04-2024		TLM8	R1	
7.	Experiment-5	3	19-04-2024		TLM8	R1	
8.	Experiment-6	3	26-04-2024		TLM8	R1	
9.	Experiment-7	3	03-05-2024		TLM8	R1	
10.	Experiment-8	3	10-05-2024		TLM8	R1	
11.	Repetition lab	3	17-05-2024		TLM8	R1	
12	Content beyond experiment	3	24-05-2024		TLM8	R1	
13.	Lab Internal	3	31-05-2024		TLM6	R1	

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

ACADEMIC CALENDAR:

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

Part-C

EVALUATION PROCESS:

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

Details of Batches: C-SEC

Batch No.	Reg.No.ofStudents	No. of Students	Batch No.	Reg.No.ofStudents	NO.of Students
A1	23761A05D3 to 5E0	08	A5	23761A05G5 to 5H2	08
A2	23761A05E1to 5E8	08	A6	23761A05H3 to 5I0	08
A3	23761A05F0 to 5F6	08	A7	23761A05I1 to 5EI9	09
A4	23761A05F7 to 5G4	08	A8	23761A05J0 to 5J8	09

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08
A1	C1	C2	F1	F2	P1	P2	E1	E2
A2	C2	C1	F2	F1	P2	P1	E2	E1
A3	F1	F2	C1	C2	E1	E2	P1	P2
A4	F2	F1	C2	C1	E2	E1	P2	P1
A5	C1	C2	F1	F2	P1	P2	E1	E2
A6	C2	C1	F2	F1	P2	P1	E2	E1
A7	F1	F2	C1	C2	E1	E2	P1	P2
A8	F2	F1	C2	C1	E2	E1	P2	P1

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle	1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
	2.	Carpentry-2(C2)-Dove tail Joint	CO1
	3.	Fitting-1(F1)-T-**J**oint	CO2
	4.	Fitting-2(F2)-V-**J**oint	CO2
	5.	Plumbing-1(P1)-Pipe Threading practice	CO3
	6.	Plumbing-2(P2)-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**
Dr. V.Dhaan Raju Ms. P. Mounika	**S.Srinivasa Reddy**	**Mr.J.Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	**: B.Tech., II-Sem., CSE -D**
ACADEMIC YEAR	**: 2023-24**
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	12/02/2024		**TLM2**		
2.	Superposition of Coherence, Conditions for Interference	1	13/02/2024		**TLM1**		
3.	Interference from thin films, colours in thin films	1	15/02/2024		**TLM1**		
4.	Newton's rings	1	16/02/2024		**TLM2**		

5.	Introduction – Diffraction, Types	1	19/02/2024		**TLM1**		
6.	Single slit diffraction	1	20/02/2024		**TLM2**		
7.	Double slit	1	22/02/2024		**TLM4**		
8.	N Slits Diffraction grating	1	23/02/2024		**TLM4**		
9.	TUTORIAL	1	26/02/2024		**TLM3**		
10.	Dispersive power & Resolving power of Grating	1	27/03/2024		**TLM3**		
11.	Polarization introduction Polarization by reflection, refraction	1	29/03/2024		**TLM1**		
12.	Double refraction, Nicol's prism	1	01/03/2024		**TLM1**		
13.	Half wave and quarter wave plate	1	04/03/2024		**TLM2**		
No. of classes required to complete UNIT-I: 13				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	05/03/2024		**TLM2**		
2.	Bravais Lattices	1	07/03/2024		**TLM1**		
3.	Packing fraction of SC, BCC	1	11/03/2024		**TLM1**		
4.	FCC	1	12/03/2024		**TLM2**		
5.	Miller Indices, separation between (hkl) planes	1	14/03/2024		**TLM2**		
6.	Bragg's law	1	15/03/2024		**TLM1**		
7.	X-ray Diffractometer	1	18/03/2024		**TLM2**		
8.	Laue's method powder method	1	19/03/2024		**TLM2**		
No. of classes required to complete UNIT-II: 8				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	21/03/2024		**TLM1**		
2.	Electronic polarization	1	22/03/2024		**TLM1**		
3.	Ionic & Orientation polarization	1	26/03/2024		**TLM1**		
4.	Local field,	1	26/03/2024		**TLM1**		
5	Clausius Mosotti equation, complex dielectric constant	1	28/03/2024		**TLM2**		
6	Frequency dependence of polarization Dielectric loss and problems	1	28/03/2024		**TLM1**		
7	Introduction to Magnetic parameters origin of magnetic moment	1	8/04/2024		**TLM1**		
8	Classification of magnetic materials – Dia, para & Ferro	1	12/04/2024		**TLM1**		
9	Classification of magnetic materials – Dia, para & Ferro Anti ferro and ferri	1	15/04/2024		**TLM2**		
10	Domain concept of ferromagnetism and domain walls	1	16/04/2024		**TLM2**		
11	Hysteresis curve soft and hard magnetic materials	1	18/04/2024		**TLM1**		
No. of classes required to complete UNIT-III: 11				No. of classes taken:			

UNIT-IV QUANTUM MECHANICS & FREE ELECTRON THEORY

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.	Introduction quantum	1	19/04/2024		**TLM1**		

	mechanics, DeBroglie hypothesis						
2.	Heisenberg uncertainty principle , Physical significance of wave function	1	22/04/2024		**TLM1**		
3.	Schrodinger time dependent & independent wave equations	1	23/04/2024		**TLM1**		
4.	Particle in a box	1	25/04/2024		**TLM1**		
5.	Classical free electron theory- postulates, Success & Failures	1	26/05/2024		**TLM2**		
6.	Quantum free electron theory, electrical conductivity	1	29/04/2024		**TLM1**		
7.	Tutorial	**1**	30/04/2024		**TLM3**		
8.	Fermi-Dirac distribution function- Temperature dependence	**1**	02/05/2024		**TLM2**		
9.	Density of states Fermi energy	**1**	03/05/2024		**TLM2**		
10.	Assignment	**1**	06/05/2024				
11.	Problem solutions	**1**	07/05/2024				
No. of classes required to complete UNIT-IV: 11				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 - Classification of semiconductors	1	09/05/2024		**TLM1**		
2.	Density of Intrinsic and semiconductors Electrons, Holes	1	10/05/2024		**TLM1**		
3.	Density of Intrinsic and semiconductors Holes	1	13/05/2024		**TLM1**		

4.	Electrical conductivity	1	14/05/2024		**TLM1**		
5.	fermi level		16/05/2024		**TLM2**		
6.	Density of Extrinsic semiconductors P-Type		17/05/2024		**TLM1**		
7.	Density of Extrinsic semiconductors N Type	1	20/06/2024		**TLM2**		
8.	Fermi level-Temperature	1	21/06/2024		**TLM1**		
9.	Drift and diffusion currents	1	23/06/2024		**TLM1**		
10.	Einstein equation		24/06/2024		TLM3		
11.	Hall effect and applications		27/06/2024		TLM3		
12.	Tutorial		28/06/2024		TLM4		
13.	Assignment		30/06/2024		TLM4		
14.	Revision		31/06/2024		TLM4		
No. of classes required to complete UNIT-V: 14				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	**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.

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

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COURSE HANDOUT

Part-A

PROGRAM	:	B.Tech., II-Sem.,CSE-D B
ACADEMIC YEAR	:	2023-2024
COURSE NAME & CODE	:	ENGINEERING PHYSICS LAB
L-T-P STRUCTURE	:	0-0-3
COURSE CREDITS	:	1
COURSE INSTRUCTOR	:	Dr. N. Aruna & Mr.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- (CSM) / B

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	14-02-2024		**TLM4**	
2.	Demonstration	3	21-02-2024		**TLM4**	
3.	Experiment 1	3	28-02-2024		**TLM4**	
4.	Experiment 2	3	06-03-2024		**TLM4**	
5.	Experiment 3	3	13-03-2024		**TLM4**	
6.	Experiment 4	3	20-03-2024		**TLM4**	
7.	Experiment 5	3	27-03-2024		**TLM4**	
8.	MID -1	3	03-04-2024		**TLM4**	
9.	Experiment 6	3	10-04-2024		**TLM4**	
10.	Experiment 7	3	24-04-2024		**TLM4**	
11.	Experiment 8	3	01-05-2024		**TLM4**	
12.	Experiment 9	3	08-05-2024		**TLM4**	
13.	Experiment 10	3	15-05-2024		**TLM4**	
14.	Revision	3	22-05-2024		**TLM4**	
15.	**Internal Exam**	3	29-05-2024		**TLM4**	
	No. of classes required to complete Syllabus:			45		

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 &Mr.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)
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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.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : I B. Tech., II-Sem., CSE-D
ACADEMIC YEAR : 2023-24
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", 44nd Edition, Khanna Publishers, New Delhi, 2017.
T2 Erwin Kreyszig, *"Advanced Engineering Mathematics"*, 10th Edition, John Wiley & sons, New Delhi, 2018.

BOS APPROVED REFERENCE BOOKS:

R1 George B. Thomas, Maurice D. Weir and Joel Hass, "*Thomas Calculus*", 14th Edition, Pearson Publishers, 2018.
R2 Dennis G. Zill and Warren S. Jones and Bartlett, "*Advanced Engineering Mathematics*",2018.
R3 Glyn James, "*Advanced Modern Engineering Mathematics*", 5th Edition, Pearson Publishers, 2018.
R4 R.K. Jain and S.R.K. Iyengar, "*Advanced Engineering Mathematics*", 5th Edition (9th reprint), Alpha Science International Ltd., 2021.
R5 B. V. Ramana, "*Higher Engineering Mathematics*", 3rd Edition McGraw Hill Education, 2017.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	13-02-2024		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	14-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	15-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	17-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	20-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	21-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	22-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	24-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	26-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	27-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	28-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	29-02-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	02-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	04-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	05-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		15			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	06-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	07-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	12-03-2024		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	13-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	14-03-2024		TLM1	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	16-03-2024		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	18-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	19-03-2024		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	20-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	21-03-2024		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	23-03-2024		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	26-03-2024		TLM1	CO1	T1,T2	
31.	TUTORIAL - II	1	27-03-2024		TLM3	CO1	T1,T2	
32.	Simple Harmonic motion	1	28-03-2024		TLM1	CO1	T1,T2	
33.	Revision	1	30-03-2024		TLM1	CO1		
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	13-04-2024		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	15-04-2024		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	16-04-2024		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	18-04-2024		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	20-04-2024		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	22-04-2024		TLM1	CO2	T1,T2	
42.	TUTORIAL - III	1	23-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentia

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	Introduction to UNIT IV	1	24-04-2024		TLM1	CO3	T1,T2	
44.	Vector Differentiation	1	25-04-2024		TLM1	CO3	T1,T2	
45.	Gradient	1	27-04-2024		TLM1	CO3	T1,T2	

46.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	30-04-2024		TLM1	CO3	T1,T2	
48.	Divergence	1	01-05-2024		TLM1	CO3	T1,T2	
49.	Curl	1	02-05-2024		TLM1	CO3	T1,T2	
50.	Problems	1	04-05-2024		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	07-05-2024		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	08-05-2024		TLM1	CO3	T1,T2	
54.	Vector Identities	1	09-05-2024		TLM1	CO3	T1,T2	
55.	TUTORIAL IV	1	13-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		13			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	14-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	15-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	16-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	21-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	22-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	23-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	28-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	29-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

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

Teaching Learning Methods

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

G.VIJAYA LAKSHMI	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 ECE

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. T. Satyanarayana **Date**: 07-02-2024

Course Name & Code : Basic Electrical & Electronics Engineering – 23EE01

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

Program/Sem./Sec. : B.Tech/I/CSE-D **A.Y.:** 2023-24

Regulations: R23

PREREQUISITE: Physics

Course Objectives (COs)

Basic Electrical Engineering:

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.

Basic Electronics Engineering

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: BASIC ELECTRICAL ENGINEERING	
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)**
PART-B: BASIC ELECTRONICS ENGINEERING	
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:

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

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

REFERENCE BOOKS:

1. Basic Electrical Engineering, D. P. Kothari and I. J. Nagrath, Mc Graw Hill, 2019, Fourth Edition
2. Principles of Power Systems, V.K. Mehtha, S.Chand Technical Publishers, 2020
3. Basic Electrical Engineering, T. K. Nagsarkar and M. S. Sukhija, Oxford University Press, 2017
4. Basic Electrical and Electronics Engineering, S. K. Bhatacharya, Person Publications, 2018, Second Edition.
5. R. S. Sedha, A Textbook of Electronic Devices and Circuits, S. Chand & Co, 2010.
6. Santiram Kal, Basic Electronics- Devices, Circuits and IT Fundamentals, Prentice Hall, India, 2002.
7. R. T. Paynter, Introductory Electronic Devices & Circuits – Conventional Flow Version, Pearson Education, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC ELECTRICAL ENGINEERING

UNIT-I: DC & AC Circuits

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and Course Outcomes	1	12-02-2024		TLM1	
2.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	14-02-2024		TLM1	
3.	Ohm's Law and its limitations	1	14-02-2024		TLM1	
4.	KCL & KVL	1	16-02-2024		TLM2	
5.	Series, Parallel, series-parallel circuits	1	17-02-2024		TLM1	
6.	Superposition theorem	1	19-02-2024		TLM1	
7.	**AC Circuits:** A.C. Fundamentals:	1	21-02-2024		TLM1	
8.	Equation of AC Voltage and current, waveform	1	21-02-2024		TLM1	
9.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	23-02-2024		TLM1	
10.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	24-02-2024		TLM1	
11.	Concept of Impedance, Active power, reactive power and apparent power	1	26-02-2024		TLM2	
12.	Concept of power factor (Simple Numerical problems).	1	28-02-2024		TLM1	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Machines and Measuring Instruments

SI.	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	28-02-2024		TLM1	
14.	Construction, principle and operation of DC Generator	1	01-03-2024		TLM2	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Construction, principle and operation of Single-Phase Transformer	1	02-03-2024		TLM2	
16.	Construction, principle and operation of Three Phase Induction Motor	1	04-03-2024		TLM2	
17.	Construction, principle and operation of Alternator	1	06-03-2024		TLM1	
18.	Applications of electrical machines	1	06-03-2024		TLM1	
19.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	11-03-2024		TLM2	
20.	Moving Iron (MI) Instruments	1	13-03-2024		TLM2	
21.	Wheatstone Bridge	1	15-03-2024		TLM1	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

UNIT-III: Energy Resources, Electricity Bill & Safety Measures

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	**Energy Resources**: Conventional and non-conventional energy resources	1	16-03-2024		TLM1	
23.	Layout and operation of various Power Generation systems: Hydel power generation	1	18-03-2024		TLM1	
24.	Layout and operation of nuclear power generation	1	20-03-2024		TLM1	
25.	Layout and operation of Solar power generation	1	20-03-2024		TLM1	
26.	Layout and operation of Wind power generation.	1	22-03-2024		TLM1	
27.	**Electricity bill:** Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc.	1	23-03-2024		TLM1	
28.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers	1	27-03-2024		TLM1	
29.	**Equipment Safety Measures:** Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits.	1	27-03-2024		TLM1	
30.	**Personal Safety Measures**: Electric Shock, Earthing and its types, Safety Precautions to	1	30-03-2024		TLM1	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	avoid shock.					
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

I Mid Examinations: 01-04-2024 to 06-04-2024

PART B: BASIC ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	Introduction – Course Outcomes	1	08-04-2024		TLM1	
32.	Evolution of electronics, Vacuum tubes to nano electronics	1	10-04-2024		TLM1	
33.	Characteristics of PN Junction Diode	1	10-04-2024		TLM1	
34.	Zener Effect — Zener Diode and its Characteristics	1	12-04-2024		TLM1	
35.	Zener Effect — Zener Diode and its Characteristics	1	13-04-2024		TLM1	
36.	Bipolar Junction Transistor	1	15-04-2024		TLM1	
37.	Bipolar Junction Transistor	1	19-04-2024		TLM1	
38.	CB Configurations and Characteristics	1	20-04-2024		TLM2	
39.	CE Configurations and Characteristics.	1	22-04-2024		TLM2	
40.	CC Configurations and Characteristics.	1	24-04-2024		TLM2	
41.	Elementary Treatment of Small Signal CE Amplifier.	1	24-04-2024		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	26-04-2024		TLM1	
43.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	27-04-2024		TLM1	
44.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	29-04-2024		TLM1	
45.	Working of simple Zener voltage regulator.	1	01-05-2024		TLM1	
46.	Working of simple Zener voltage regulator.	1	01-05-2024		TLM2	
47.	**Amplifiers**: Block diagram of Public Address system	1	03-05-2024		TLM1	
48.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	04-05-2024		TLM2	
49.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	06-05-2024		TLM1	
50.	**Electronic Instrumentation:** Block diagram of an electronic	1	08-05-2024		TLM2	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	instrumentation system.					
51.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	08-05-2024		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Digital Electronics

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
52.	Overview of Number Systems	1	10-05-2024		TLM1	
53.	Logic gates including Universal Gates	1	11-05-2024		TLM2	
54.	BCD codes	1	13-05-2024		TLM1	
55.	Excess-3 code, gray code	1	15-05-2024		TLM2	
56.	Hamming code	1	15-05-2024		TLM1	
57.	Boolean Algebra	1	17-05-2024		TLM1	
58.	Basic Theorems and properties of Boolean Algebra	1	18-05-2024		TLM1	
59.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	20-05-2024		TLM1	
60.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	22-05-2024		TLM1	
61.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	22-05-2024		TLM1	
62.	Simple combinational circuits	1	24-05-2024		TLM2	
63.	Half and Full Adders	1	25-05-2024		TLM1	
64.	Introduction to sequential circuits	1	27-05-2024		TLM2	
65.	Flip flops	1	29-05-2024		TLM2	
66.	Flip flops	1	29-05-2024		TLM1	
67.	Registers and counters	1	31-05-2024		TLM2	
68.	Revision of Unit-I, II & III	1	01-06-2024		TLM2	
No. of classes required to complete UNIT-III: 15				**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/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	12-02-2024	30-03-2024	8W
I Mid Examinations	01-04-2024	06-04-2024	1W
II Phase of Instructions	08-04-2024	01-06-2024	8W
II Mid Examinations	03-06-2024	08-06-2024	1W
Preparation and Practicals	10-06-2024	15-06-2024	1W
Semester End Examinations	17-06-2024	29-06-2024	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.

Date: 07-02-2024

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Dr. T. Satyanarayana	Dr. T. Satyanarayana	Dr. G. Srinivasulu	Dr. Y. Amar Babu

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

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

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

DEPARTMENT OF ECE

LAB HANDOUT

PART-A

Date: 07-02-2024

Name of Course Instructor : Dr. T. Satyanarayana, Mrs. B. Rajeswari, Mr. Ch. Mallikharjuna Rao, Mr. Ch. Siva Rama Krishna

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

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

Program/Sem/Sec : B.Tech., ECE., I-Sem., Section- C **A.Y.** : 2023-24

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): BATCH-I

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to BEEE Lab (Function Generators, CRO, RPS, Breadboard etc), Course Objectives and Outcomes.	3	15-02-2024		TLM4	
2.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	22-02-2024		TLM4	
3.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.	3	29-02-2024		TLM4	
4.	Implementation of half wave and full wave rectifiers	3	07-03-2024		TLM4	
5.	Plot Input & Output characteristics of BJT in CE and CB configurations	3	14-03-2024		TLM4	
6.	Frequency response of CE amplifier.	3	21-03-2024		TLM4	
7.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	28-03-2024		TLM4	
8.	Internal Lab Examination (**Electronics**)	3	04-04-2024		TLM4	
9.	Verification of KCL and KVL	3	18-04-2024		TLM4	
10.	Verification of Superposition Theorem	3	25-04-2024		TLM4	
11.	Measurement of Resistance using Wheat stone bridge	3	02-05-2024		TLM4	
12.	Magnetization Characteristics of DC Shunt Generator	3	09-05-2024		TLM4	
13.	Measurement of Power and Power factor using Single-phase wattmeter	3	16-05-2024		TLM4	
14.	Calculation of Electrical Energy for Domestic Premises	3	23-05-2024		TLM4	
15.	Internal Lab Examination (**Electricals**)	3	30-05-2024		TLM4	
No. of classes required: 45				**No. of classes taken:**		

COURSE DELIVERY PLAN (LESSON PLAN): BATCH-II

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to BEEE Lab (Function Generators, CRO, RPS, Breadboard etc), Course Objectives and Outcomes.	3	15-02-2024		TLM4	
2.	Verification of KCL and KVL	3	22-02-2024		TLM4	
3.	Verification of Superposition Theorem	3	29-02-2024		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	07-03-2024		TLM4	
5.	Magnetization Characteristics of DC Shunt Generator	3	14-03-2024		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	21-03-2024		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	28-03-2024		TLM4	
8.	Internal Lab Examination (**Electricals**)	3	04-04-2024		TLM4	
9.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	18-04-2024		TLM4	
10.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.	3	25-04-2024		TLM4	
11.	Implementation of half wave and full wave rectifiers	3	02-05-2024		TLM4	
12.	Plot Input & Output characteristics of BJT in CE and CB configurations	3	09-05-2024		TLM4	
13.	Frequency response of CE amplifier.	3	16-05-2024		TLM4	
14.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	23-05-2024		TLM4	
15.	Internal Lab Examination (**Electronics**)	3	30-05-2024		TLM4	
No. of classes required: 45				**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.

Date: 07-02-2024

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Dr. T. Satyanarayana	Dr. A. Narendra Babu	Dr. G. Srinivasulu	Dr. Y. Amar Babu

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. CH. Siva Sankara Babu,
Mr. K.V. Visewandh,
Mr. S. Indrasena Reddy

Course Name & Code : Engineering Graphics – 23ME01

L-T-P Structure : 2-3-0 **Credits:** 3

Program/Sem/Sec : B.Tech/II SEM CSE-D SEC **A.Y.:** 2023-24

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. (**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	Able to 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	-	-	-	-	-	-	-	-	3	1	1	2
CO3	3	2	2	-	-	-	-	-	-	-	-	3	-	1	2
CO4	3	2	2	-	-	-	-	-	-	-	-	3	2	1	2
CO5	2	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, SciTechpublishers.

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, 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	1	13-02-2024		TLM1,2	
2.	Principles of Engineering Graphicsand their significance, Drawing Instruments and their use-Conventions in Drawing	2	13-02-2024		TLM1,2	
3.	Lettering and Dimensioning – BIS Conventions and practice	1	17-02-2024		TLM1,3	
4.	Practice	1	17-02-2024		TLM3	
5.	Geometrical Constructions	1	20-02-2024		TLM1	
6.	Practice	2	20-02-2024		TLM3	
7.	Engineering Curves: Conic Sections-Construction of ellipse	2	24-02-2024		TLM1	
8.	Practice	3	27-02-2024		TLM3	
9.	Construction of Parabola and Hyperbola	2	02-03-2024		TLM1	
10.	Practice	3	05-03-2024		TLM3	
11.	Construction of cycloid, Epicycloid and hypocycloid, Involutes	2	09-03-2024		TLM1	
12.	Introduction to orthographic Projections, First and third angle projection methods, Projections of Points in all quadrants	1	12-03-2024		TLM1	
13.	Practice	2	12-03-2024		TLM3	
No. of classes required to complete UNIT-I: 23 (Lecture:12 Practice:11)				**No. of classes taken: (including Practice)**		

UNIT-II: PROJECTIONS OF LINES AND 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
1.	**Projections of straight lines:** Projections of straight lines parallel to both reference planes, perpendicular to one reference plane and parallel to other reference plane	2	16-03-2024		TLM1	
2.	Practice	3	19-03-2024		TLM3	
3.	Projections of lines inclined to one reference plane and parallel to the other reference plane. Projections of Straight Line Inclined to both the reference planes.	2	23-03-2024		TLM1	
4.	Practice	3	26-03-2024		TLM3	
5.	**Projections of Planes:** Projections of Regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane;	2	30-03-2024		TLM1	
6.	**Projections of p**l a n e s inclined to both the reference planes.	1	02-04-2024		TLM1	
7.	Practice	2	02-04-2024		TLM3	
No. of classes required to complete UNIT-II: 13 (Lecture:6 Practice:7)				**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
1.	**Types of solids:** Polyhedra and Solids of revolution. Projections of solids in simple positions.	1	13-04-2024		TLM1	
2.	Practice	1	13-04-2024		TLM3	
3.	Projection of solids: Axis perpendicular to horizontal plane & Axis perpendicular to vertical plane	1	16-04-2024		TLM1	
4.	Practice	2	16-04-2024		TLM3	
5.	Projection of solids: Axis parallel to both the reference planes	2	20-04-2024		TLM1	
6.	Practice	3	23-04-2024		TLM3	
7.	Projection of solids: Projection of Solids with axis inclined to one reference plane and parallel to another plane.	1	27-04-2024		TLM1	
8.	Practice	1	27-04-2024		TLM3	
No. of classes required to complete UNIT-III: 12 (Lecture:5 Practice:7)				**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	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to section planes and sections of solids	1	30-04-2024		TLM1	
2.	Practice	2	30-04-2024		TLM3	
3.	Perpendicular to one reference plane and parallel to other reference plane, Inlcined to one reference plane and perpendicular to other plane	2	04-05-2024		TLM1	
4.	Sectional views of solids and true shapes, Sections of solids in simple position only	1	07-05-2024		TLM1	
5.	Practice	2	07-05-2024		TLM3	
6.	**Development of Surfaces:** Introduction to Methods of development of surfaces, Parallel line development	1	14-05-2024		TLM1	
7.	Practice	2	14-05-2024		TLM3	
8.	Radial line development, Development of a cube, prism, cylinder, pyramid and cone.	2	18-05-2024		TLM1	
No. of classes required to complete UNIT-IV: 13 (Lecture:7 Practice:6)				**No. of classes taken: (including Practice)**		

UNIT-V: CONVERSION 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
1.	Introduction to Isometric Views, Theory of isometric projection, isometric views	1	21-05-2024		TLM 2	
2.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing	1	21-05-2024		TLM 1	
3.	Practice	1	21-05-2024		TLM 3	
4.	Conversion of Orthographic Projections to Isometric Views of objects	1	25-05-2024		TLM1	
5.	Practice	1	25-05-2024		TLM3	
6.	Conversion of Orthographic Projections to Isometric Views of objects	1	28-05-2024		TLM1	
7.	Practice	2	28-05-2024		TLM 3	
8.	Creating 2D and 3D drawings of objects using AutoCAD	1	01-06-2024		TLM 3	
9.	PCB using AutoCAD, Transformations using AutoCAD	1	01-06-2024		TLM 3	
10.	Practice	1	01-06-2024		TLM 3	
No. of classes required to complete UNIT-V: 11 (Lecture:6 Practice:5)				**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)	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):

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 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, tomanage 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.

Signature				
Name of the Faculty	Dr. Ch. Siva Sankara Babu	Dr. K. Dilip Kumar	Mr. J. Subba Reddy	Dr. M.B.S Sreekara Reddy
Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. 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 /D **A.Y.:** 2023-24

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		
CO2	3	2	2	1									2		
CO3	3	2	2	1									2		
CO4	3	2	2	1									2		
CO5	3	2	2	1									2		
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	12-02-2024		TLM1	
2.	Definition and Importance of Linear Data Structures	1	13-02-2024		TLM1	
3.	Abstract Data Types and Implementation	1	14-02-2024		TLM1	
4.	Overview of time and space complexity	1	16-02-2024		TLM1	
5.	Analysis of Liner Data structures	2	17-02-2024 19-02-2024		TLM1	
6.	Revise Arrays	1	20-02-2024		TLM1	
7.	Searching Techniques: Linear Search	1	21-02-2024		TLM1	
8.	Binary Search & Analysis	2	23-02-2024 24-02-2024		TLM1	
9.	Bubble Sort & Analysis	1	26-02-2024		TLM1	
10.	Insertion Sort & Analysis	2	27-02-2024 28-02-2024		TLM1	
11.	Selection Sort & Analysis	2	01-03-2024 02-03-2024		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	04-03-2024		TLM1	
13.	Linked List Representation	1	05-03-2024		TLM1	
14.	Sing Linked List : Operations	3	06-03-2024 11-03-2024 12-03-2024		TLM1	
15.	Double Linked List : Operations	2	13-03-2024 15-03-2024		TLM1	
16.	Circular Single Linked List	1	16-03-2024		TLM1	
17.	Circular Double Linked List	2	18-03-2024 19-03-2024		TLM1	
18.	Comparing Arrays and Linked List	1	20-03-2024		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	22-03-2024		TLM1	
20.	Polynomial Addition	1	23-03-2024		TLM1	
No. of classes required to complete UNIT-II: 13				**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	26-03-2024		TLM1	

22.	Operations of Stacks	1	27-03-2024		TLM1	
23.	Implementation of stacks using arrays	1	30-03-2024		TLM1	
24.	Stacks using Linked List	1	08-04-2024		TLM1	
25.	Expressions: Expression evaluation	2	10-04-2024 12-04-2024		TLM1	
26.	Infix to Postfix Conversion	2	15-04-2024 16-04-2024		TLM1	
27.	Checking Balanced Parenthesis	1	19-04-2024		TLM1	
28.	Reversing a List	1	20-04-2024		TLM1	
29.	Backtracking	1	22-04-2024		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	23-04-2024		TLM1	
31.	Implementing queues using arrays	1	24-04-2024		TLM1	
32.	Implementing queues using Linked List	1	26-04-2024		TLM1	
33.	Applications of Queue : Scheduling	1	27-04-2024		TLM1	
34.	Breadth First Search	1	29-04-2024		TLM1	
35.	Circular Queue	2	30-04-2024 01-05-2024		TLM1	
36.	Double ended queue	2	03-05-2024 04-05-2024		TLM1	
37.	Applications of Deque	1	06-05-2024		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	07-05-2024		TLM1	
39.	Representation of Trees	1	08-05-2024		TLM1	
40.	Tree Traversals	1	10-05-2024		TLM1	
41.	Binary Search Trees-Operations	2	13-05-2024 14-05-2024		TLM1	
42.	Hashing Introduction	1	15-05-2024		TLM1	
43.	Hash Functions	1	17-05-2024		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	18-05-2024		TLM1	
45.	Open Addressing: Linear Probing	1	20-05-2024		TLM1	
46.	Quadratic Probing, Double Hashing	1	21-05-2024		TLM1	
47.	Rehashing	1	22-05-2024		TLM1	
48.	Applications of Hashing	2	24-05-2024 25-05-2024		TLM1	
49.					TLM1	
No. of classes required to complete UNIT-V: 13				**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	26-05-2024					
2.	Towers of Hanoi	1	28-05-2024					
3.	Extendable Hashing	1	29-05-2024 01-06-2024					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/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 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. S.Nagarjuna Reddy**	**Dr. Y.V.B Reddy**	**Dr. D.Veeriaha**
Signature				

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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/D **A.Y.:** 2023-24

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		
CO2	3	2	2	1	3								3		
CO3	3	2	2	1	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	16-02-2024		
2.	Searching and Sorting Techniques	3	23-02-2024		
3.	Single Linked List	3	01-03-2024		
4.	Double Linked List	3	15-03-2024		
5.	Circular Linked List	3	22-03-2024		
6.	Polynomial Representation & Polynomial Addition	3	12-04-2024		
7.	Linked List Applications	3	19-04-2024		
8.	Stack Implementation	3	26-04-2024		
9.	Stack Applications	3	03-05-2024		
10.	Queue Implementation & Circular Queue	3	10-05-2024		
11.	Double Ended Queue	3	17-05-2024		
12.	Trees, Hashing	3	24-05-2024		
13.	Internal Exam	3	31-05-2024		

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.
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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	Dr. S. Srinivasa Reddy	Dr. S. Nagarjuna Reddy	Dr. Y.V.B Reddy	**Dr. D. Veeriaha**
Signature				

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. II-Sem, CSE - D

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr. S. Srinivasa Reddy, (T808), Sr. Asst. Professor,
Ms. P. Mounika, (T872), Asst. Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, (T113), Assoc. Professor

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

COURSE OBJECTIVE:

The objective of this course is to get 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-A (BATCH-A1)

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 Programme	3	12.02.2024		TLM8	-	
2.	Demonstration	3	12.02.2024		TLM8	R1	
3.	Experiment-1	3	19.02.2024		TLM8	R1	
4.	Experiment-2	3	26.02.2024		TLM8	R1	
5.	Experiment-3	3	04.03.2024		TLM8	R1	
6.	Experiment-4	3	11.03.2024		TLM8	R1	
7.	Experiment-5	3	18.03.2024		TLM8	61	
I-Mid Examinations (01.04.2024 – 06.04.2024)							
8.	Experiment-6	3	08.04.2024		TLM8	R1	
9.	Practice Lab	3	15.04.2024		TLM8		
10.	Experiment-7	3	22.04.2024		TLM8	R1	
11.	Practice Lab	3	29.04.2024		TLM8		
12.	Experiment-8	3	06.05.2024		TLM8	R1	
13.	Practice Lab	3	13.05.2024		TLM8		
14.	Repetition lab	3	20.05.2024		TLM8		
15.	Lab Internal	3	27.05.2024		TLM6		
II- Mid Examinations (03.06.2024 – 08.06.2024)							

COURSE DELIVERY PLAN (LESSON PLAN): Section-A (BATCH-A2)

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 Programme	3	12.02.2024		TLM8	-	
2.	Demonstration	3	12.02.2024		TLM8	R1	
3.	Experiment-1	3	19.02.2024		TLM8	R1	
4.	Experiment-2	3	26.02.2024		TLM8	R1	
5.	Experiment-3	3	04.03.2024		TLM8	R1	

6.	Experiment-4	3	11.03.2024		TLM8	R1	
7.	Experiment-5	3	18.03.2024		TLM8	R1	
I-Mid Examinations (01.04.2024 – 06.04.2024)							
8.	Experiment-6	3	08.04.2024		TLM8	R1	
9.	Practice Lab	3	15.04.2024				
10.	Experiment-7	3	22.04.2024		TLM8	R1	
11.	Practice Lab	3	29.04.2024				
12.	Experiment-8	3	06.05.2024		TLM8	R1	
13.	Practice Lab	3	13.05.2024				
14.	Repetition	3	20.05.2024		TLM8	R1	
15.	Lab Internal	3	27.05.2024		TLM6	-	
II- Mid Examinations (03.06.2024 – 08.06.2024)							

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
Commencement of Class work	12.02.2024		
I Phase of Instructions-1	12.02.2024	05.04.2024	8W
I Mid Examinations	01.04.2024	06.04.2024	1W
II Phase of Instructions	08.04.2024	01.06.2024	8W
II Mid Examinations	03.06.2024	08.06.2024	1W
Preparation and Practical's	10.06-2024	15.06.2024	1W
Semester End Examinations	17.06.2024	29.06.2024	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: II- CSE - D

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B11	23761A05J9-K6	08	B21	23761A05N1-N8	08
B12	23761A05K7- L4	08	B22	23761A05N9-O7	08
B13	23761A05L5- M2	08	B23	23761A05O8- P5	08
B14	23761A05M3-N0	08	B24	23761A05P6-Q4	09

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

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

cycle	Exp. No.	Name of the Experiment	Related CO
Cycle 1	1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
	2.	Carpentry-2(C2)-Dove tail Joint	CO1
	3.	Fitting-1(F1)-T-**J**oint	CO2
	4.	Fitting-2(F2)-V-**J**oint	CO2
	5.	Plumbing-1(P1)-Pipe Threading practice	CO3
	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**
Mr. S. Srinivasa Reddy (T808), Ms. P. Mounika (T872)	**S.Srinivasa Reddy (T113)**	**Dr. M. B. S Sreekara Reddy (T875)**	**Dr. M. B. S Sreekara Reddy (T875)**