



# 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, N.T.R DIST., A.P.-521 230.

## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Mr. Nazumuddin Shaik/ Mr. I. Dakshina Murthy  
**Course Name &** : Engineering Workshop & 23ME51 **Regulation** : R23  
**L-T-P Structure** : 0-0-3 **Credits** : 1.5  
**Program/Sem/Sec** : B. Tech/IT/II Sem-B **A.Y.** : 2023-24

**PREREQUISITE:** Nil

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

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

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

**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	-	-	2
CO2	3	-	2	3	3	3	-	-	3	-	-	2	-	-	2
CO3	3	-	2	3	3	3	-	-	3	-	-	2	-	-	2
CO4	3	-	2	3	3	3	-	-	3	-	-	2	-	-	2
1 - Low                      2 -Medium                      3 - High															

#### **Textbooks:**

- T1.** Basic Workshop Technology: Manufacturing Process, Felix W.; Independently Published, 2019. Workshop Processes, Practices and Materials; Bruce J. Black, Routledge publishers, 5th Edn. 2015.
- T2.** A Course in Workshop Technology Vol I. & II, B.S. Raghuwanshi, Dhanpath Rai & Co., 2015 & 2017.

**Reference Books:**

- R1.** LBRCE Workshop Lab Manual.  
**R2.** Elements of Workshop Technology, Vol. I by S. K. Hajra Choudhury & Others, Media Promoters and Publishers, Mumbai. 2007, 14th edition.  
**R3.** Workshop Practice by H. S. Bawa, Tata-McGraw Hill, 2004.  
**R4.** Wiring Estimating, Costing and Contracting; Soni P.M. & Upadhyay P.A.; Atul Prakash an, 2021-22.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):**

Si.No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
<b>CYCLE-I</b>						
1.	<b>Introduction to Lab</b>	3	13-02-2024		TLM8	
2.	<b>WOODWORK:</b> Dove Tail Joint	3	20-02-2024		TLM8	
3.	Corner Lap Joint	3	27-02-2024		TLM8	
4.	<b>FITTING:</b> T-Fitting	3	05-03-2024		TLM8	
5.	V-Fitting	3	12-03-2024		TLM8	
6.	<b>ELECTRICAL WIRING:</b> Two Laps in Series and Parallel Connection with One Way Switch	3	19-03-2024		TLM8	
7.	Florescent Lamp and Calling Bell Circuit	3	26-03-2024		TLM8	
8.	<b>PLUMBING:</b> Preparation of Pipe Layout- Demonstration and practice of Plumbing tools	3	16-04-2024		TLM8	
<b>CYCLE-II</b>						
9.	Pipe Threading- Preparation of Pipe joints with coupling for same diameter and with reducer for different diameters.	3	23-04-2024		TLM 8	
10.	<b>SHEET METAL WORKING:</b> Preparation of Tapered Tray	3	30-04-2024		TLM8	
11.	<b>FOUNDRY TRADE:</b> Demonstration and practice on Moulding tools and processes, Preparation of Green Sand Moulds for given Patterns.	3	07-05-2024		TLM8	
12.	<b>WELDING SHOP:</b> Demonstration and practice on Arc Welding and Gas	3	14-05-2024		TLM8	

	welding. Preparation of Lap joint and Butt joint.				
13.	<b>BASIC REPAIRS OF TWO-WHEELER VEHICLE:</b> Demonstration of working of two-wheeler vehicle and its repairs.	3	14-05-2024		TLM8
14.	Repetition	3	21-05-2024		TLM8
15.	Internal Lab Exam	3	28-05-2024		-----
<b>No. of classes required to complete:</b>				<b>No. of classes taken:</b>	

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

### **PART-C**

#### **ACADEMIC CALENDAR**

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

#### **EVALUATION PROCESS (R23 Regulation):**

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

## PART-D

### PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

<b>PEO1</b>	Pursue a successful career in the area of Information Technology or its allied fields.
<b>PEO2</b>	Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.
<b>PEO3</b>	Able to demonstrate self-learning, life-long learning, and work in teams on multidisciplinary projects.
<b>PEO4</b>	Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, teamwork, and leadership skills in their job.

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
<b>PO 9</b>	<b>Individual and teamwork:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):**

<b>PSO1</b>	Organize, Analyze and Interpret the data to extract meaningful conclusions.
<b>PSO2</b>	Design, Implement and Evaluate a computer-based system to meet desired needs.
<b>PSO3</b>	Develop IT application services with the help of different current engineering tools.

<b>Signature</b>				
<b>Name of the Faculty</b>	Mr. Nazumuddin Shaik	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. P. Lovaraju
<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>Head of the Department</b>



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<http://lbrce.ac.in/it/index.php>, [hodit@lbrce.ac.in](mailto:hodit@lbrce.ac.in), Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Mr. G. V. Surya Narayana

**Course Name &** : Engineering Workshop & 23ME51

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

**Program/Sem/Sec** : B. Tech/IT/II Sem-A

**Regulation** : R23

**Credits** : 1.5

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

**PREREQUISITE:** Nil

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CO2	3	--	2	3	3	3	--	--	3	--	--	2	--	--	2
CO3	3	--	2	3	3	3	--	--	3	--	--	2	--	--	2
CO4	3	--	2	3	3	3	--	--	3	--	--	2	--	--	2
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### **PART-C**

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<b>Evaluation Task</b>	<b>Expt. no's</b>	<b>Marks</b>
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<b>Cumulative Internal Examination: A+B+C = 30</b>	1,2,3,4,5,6,7,8	<b>30</b>
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<b>Total Marks: A+ B + C + D = 100</b>	1,2,3,4,5,6,7,8	<b>100</b>



## PART-D

### PROGRAM EDUCATIONAL OBJECTIVES (PEOS):

<b>PEO1</b>	Pursue a successful career in the area of Information Technology or its allied fields.
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### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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<b>PO 11</b>	<b>Project management and finance:</b> 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.
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**PROGRAMME SPECIFIC OUTCOMES (PSOs):**

<b>PSO1</b>	Organize, Analyze and Interpret the data to extract meaningful conclusions.
<b>PSO2</b>	Design, Implement and Evaluate a computer-based system to meet desired needs.
<b>PSO3</b>	Develop IT application services with the help of different current engineering tools.

**Course Instructor**

**Module Coordinator**

**Head of the  
Department**

**Signature**

**Name of  
the Faculty**

Mr. G.V. SURYA NARAYANA

MR. J. SUBBA REDDY

Dr. P. LOVARAJU



**FRESHMAN ENGINEERING DEPARTMENT**

**COURSE HANDOUT**

**Part-A**

<b>PROGRAM</b>	: I B. Tech., I-Sem., IT - B
<b>ACADEMIC YEAR</b>	: 2023-24
<b>COURSE NAME &amp; CODE</b>	: Differential Equations & Vector Calculus
<b>L-T-P STRUCTURE</b>	: 3-0-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: Dr. Y.P.C.S. Anil Kumar
<b>COURSE COORDINATOR</b>	: Dr.
<b>PRE-REQUISITES</b>	: Basics of Vectors, Differentiation, Integration

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**

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

**COURSE OUTCOMES (COs)**

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

- CO1: Solve the differential equations related to various engineering fields – **L3**  
CO2: Apply knowledge of partial differentiation in modeling and solving of Partial differential equations – **L3**  
CO3: Interpret the physical meaning of different operators such as gradient, curl and divergence – **L3**  
CO4: Evaluate the work done against a field, circulation and flux using Vector Calculus – **L3**

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

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

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

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

**BOS APPROVED TEXT BOOKS:**

- T1** Dr. B.S. Grewal, "Higher Engineering Mathematics", 44<sup>nd</sup> Edition, Khanna Publishers, New Delhi, 2017.  
**T2** Erwin Kreyszig, "Advanced Engineering Mathematics", 10<sup>th</sup> Edition, John Wiley & sons, New Delhi, 2018.

**BOS APPROVED REFERENCE BOOKS:**

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

**Part-B**

**COURSE DELIVERY PLAN (LESSON PLAN):**

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	12-02-2024		TLM2			
2.	Course Outcomes, Program Outcomes	1	14-02-2024		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	15-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	16-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	17-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	19-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	21-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	22-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	23-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	24-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	26-02-2024		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	28-02-2024		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	29-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	01-03-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	02-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	04-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	06-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		15			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	07-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	09-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for $e^{ax+b}$	1	13-03-2024		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	14-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	15-03-2024		TLM1	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	16-03-2024		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	18-03-2024		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	20-03-2024		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	21-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	22-03-2024		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	2	28-03-2024 30-03-2024		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

#### UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	08-04-2024		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	10-04-2024		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	12-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	13-04-2024		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	15-04-2024		TLM1	CO2	T1,T2	
38.	Lagrange's Method	1	18-04-2024		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	19-04-2024		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	20-04-2024		TLM1	CO2	T1,T2	
41.	TUTORIAL - III	1	22-04-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

#### UNIT-IV: Vector Differentia

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Introduction to UNIT IV	1	24-04-2024		TLM1	CO3	T1,T2	
43.	Vector Differentiation	1	25-04-2024		TLM1	CO3	T1,T2	
44.	Gradient	1	26-04-2024		TLM1	CO3	T1,T2	

45.	Directional Derivative	1	27-04-2024		TLM1	CO3	T1,T2	
46.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
47.	Divergence	1	01-05-2024		TLM1	CO3	T1,T2	
48.	Curl	1	02-05-2024		TLM1	CO3	T1,T2	
49.	Problems	1	03-05-2024		TLM1	CO3	T1,T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	04-05-2024		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		TLM1	CO3	T1,T2	
52.	Laplacian, second order operators	1	08-05-2024		TLM1	CO3	T1,T2	
53.	Vector Identities	1	09-05-2024		TLM1	CO3	T1,T2	
54.	TUTORIAL IV	1	10-05-2024		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	11-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	13-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	15-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	16-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	17-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	18-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	20-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	22-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	23-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Theorem	2	24-05-2024 25-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	2	27-05-2024 29-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	29-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		14			No. of classes taken:			

#### Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
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
---------------------------

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

**PART-CEVALUATION PROCESS (R23 Regulation):**

<b>Evaluation Task</b>	<b>Marks</b>
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
<b>Mid Marks =80% of Max ((M1+Q1+A1), (M2+Q2+A2)) + 20% of Min ((M1+Q1+A1), (M2+Q2+A2))</b>	<b>M=30</b>
<b>Cumulative Internal Examination (CIE):</b>	<b>30</b>
<b>Semester End Examination (SEE)</b>	<b>70</b>
<b>Total Marks = CIE + SEE</b>	<b>100</b>

**PART-D PROGRAMME OUTCOMES (POs):**

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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.

<b>Dr. K.R. Kavitha</b>		<b>Dr. A. RAMI REDDY</b>	<b>Dr. A. RAMI REDDY</b>
Course Instructor	Course Coordinator	Module Coordinator	HOD



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

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

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## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor** : Mrs M.Hema Latha

**Course Name & Code** : DATA STRUCTURES & 23CS02

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

**Credits:** 3

**Program/Sem/Sec** : B.Tech/IT/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

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

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	2											2		
<b>CO2</b>	3	2	2	1									2		
<b>CO3</b>	3	2	2	1									2		
<b>CO4</b>	3	2	2	1									2		
<b>CO5</b>	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	13-02-24		TLM1	
2.	Definition and Importance of Linear Data Structures	1	14-02-24		TLM1	
3.	Abstract Data Types and Implementation	1	15-02-24		TLM1	
4.	Overview of time and space complexity	1	17-02-24		TLM1	
5.	Analysis of Linear Data structures	1	19-02-24		TLM1	
6.	Revise Arrays	1	20-02-24		TLM 1	
7.	Searching Techniques: Linear Search	1	21-02-24		TLM 1 & 4	
8.	Binary Search & Analysis	1	26-02-24		TLM 1 & 4	
9.	Bubble Sort & Analysis	1	27-02-24		TLM 1 & 4	
10.	Insertion Sort & Analysis	1	28-02-24		TLM 1 & 4	
11.	Selection Sort & Analysis	1	29-02-24		TLM 1 & 4	
12.	Tutorial	1	02-03-24		TLM3	
13.	Revision & Assignment	1	04-03-24		TLM2	
<b>No. of classes required to complete UNIT-I: 13</b>				<b>No. of classes taken:</b>		

#### 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
14.	List Implementation using Arrays and Array Disadvantages	1	05-03-24		TLM 1 & 4	
15.	Linked List Representation	1	06-03-24		TLM 1	
16.	Sing Linked List : Operations	3	07-03-24 11-03-24 12-03-24		TLM 1 & 4	
17.	Double Linked List : Operations	2	13-03-24 14-03-24		TLM 1 & 4	

18.	Circular Single Linked List	1	16-03-24		TLM1	
19.	Circular Double Linked List	2	18-03-24 19-03-24		TLM 1& 4	
20.	Comparing Arrays and Linked List	1	20-03-24		TLM1	
21.	Applications of Linked Lists: Polynomial Representation	1	21-03-24		TLM1	
22.	Polynomial Addition	1	23-03-24		TLM 1&4	
23.	Tutorial	1	26-03-24		TLM3	
24.	Revision & Assignment	1	27-03-24		TLM2	
<b>No. of classes required to complete UNIT-II: 15</b>				<b>No. of classes taken:</b>		

#### 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
25.	Introduction to Stacks : Properties	1	08-04-24		TLM 1	
26.	Operations of Stacks	1	10-04-24		TLM 1	
27.	Implementation of stacks using arrays	1	15-04-24		TLM 1 & 4	
28.	Stacks using Linked List	1	16-04-24		TLM 1 & 4	
29.	Expressions: Expression evaluation	2	18-04-24		TLM1	
30.	Infix to Postfix Conversion	2	20-04-24		TLM1	
31.	Checking Balanced Parenthesis	2	22-04-24		TLM1	
32.	Reversing a List	1	23-04-24		TLM1	
33.	Backtracking	1	24-04-24		TLM1	
34.	Tutorial	1	25-04-24		TLM3	
35.	Revision & Assignment	1	27-04-24		TLM2	
<b>No. of classes required to complete UNIT-III: 14</b>				<b>No. of classes taken:</b>		

#### 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
36.	Introduction to queues: properties and operations,	1	29-04-24		TLM1	
37.	Implementing queues using arrays	1	30-04-24		TLM 1 & 4	

38.	Implementing queues using Linked List	1	01-05-24		TLM 1 & 4	
39.	Applications of Queue : Scheduling	1	02-05-24		TLM 1	
40.	Breadth First Search	1	04-05-24		TLM 1 & 4	
41.	Circular Queue	1	06-05-24		TLM 1& 4	
42.	Double ended queue	1	07-05-24		TLM 1	
43.	Applications of Deque	1	08-05-24		TLM 1	
44.	Revision & Assignment	1	09-05-24		TLM 2	
<b>No. of classes required to complete UNIT-IV: 09</b>				<b>No. of classes taken:</b>		

#### UNIT-V: TREES & HASHING TECHNIQUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Introduction to Trees,	1	13-05-24		TLM 1	
46.	Representation of Trees	1	14-05-24		TLM 1	
47.	Tree Traversals	1	15-05-24		TLM 1 & 4	
48.	Binary Search Trees- Operations	2	16-05-24 18-05-24		TLM 1& 4	
49.	Hashing Introduction, Hash Functions	1	20-05-24		TLM 1	
50.	Collison Resolution Techniques: Separate Chaining	1	21-05-24		TLM 1	
51.	Open Addressing: Linear Probing	1	22-05-24		TLM 1	
52.	Quadratic Probing, Double Hashing	1	23-05-24		TLM 1	
53.	Rehashing	1	25-05-24		TLM 1	
54.	Applications of Hashing	1	28-05-24		TLM 1	
55.	Revision & Assignment	1	29-05-24		TLM2	
<b>No. of classes required to complete UNIT-V: 12</b>				<b>No. of classes taken:</b>		

## 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	HOD Sign Weekly
1.	Evaluation of Prefix Expression	1	28-03-24		TLM 1 & 4	CO5	
2.	Towers of Hanoi	1	30-03-24		TLM 1 & 4	CO5	
3.	Extendable Hashing	1	30-05-24		TLM 1		

### II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)

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

## PART-C

### EVALUATION PROCESS (R23 Regulation):

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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Signature				
Name of the Faculty	Mrs M Hema Latha	Dr S Nagarjuna Reddy	Dr K Phaneendra	Dr. B.Srinivasa Rao



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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## DEPARTMENT OF INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Mrs M.Hema latha

**Course Name & Code** : DATA STRUCTURES LAB & 23CS52

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

**Program/Sem/Sec** : B.Tech/IT/II/B

**Credits:** 1.5

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

**PREREQUISITE:** Programming for Problem Solving Using C

#### **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	15-02-2024		
2.	Searching and Sorting Techniques	3	22-02-2024		
3.	Single Linked List	3	29-02-2024		
4.	Double Linked List	3	07-03-2024		
5.	Circular Linked List	3	14-03-2024		
6.	Polynomial Representation & Polynomial Addition	3	21-03-2024		
7.	Linked List Applications	3	28-03-2024		
8.	Stack Implementation	3	18-04-2024		
9.	Stack Applications	3	25-04-2024		
10.	Queue Implementation & Circular Queue	3	02-05-2024		
11.	Double Ended Queue	3	09-05-2024		
12.	Trees	3	16-05-2024		
13.	Hashing	3	23-05-2024		
14.	Internal Exam	3	30-05-2024		

**PART-C****EVALUATION PROCESS (R23 Regulation):**

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

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Signature				
Name of the Faculty	Mrs M.Hema Latha Mr. V.V.Krishna Reddy Mr.M.Vijay Kumar Mrs S.Jyothi	Dr.S.Nagarjuna Reddy	Dr K.Phaneendra	Dr.B.Srinivasa Rao





# 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 CIVIL ENGINEERING

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor:** Dr. V. Ramakrishna, Professor,  
Mr. K. Harish Kumar, Sr. Assistant Professor  
Mrs. P. Keerthi, Assistant Professor

**Course Name & Code** : Engineering Graphics-23ME01

**L-T-P Structure** : 3-0-4

**Program/Sem/Sec** : B.Tech, II SEM, IT-B

**Credits:** 3

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

**PREREQUISITE:** Engineering Physics, Mathematics

#### **COURSE EDUCATIONAL OBJECTIVES (CEOs):**

- To enable the students with various concepts like dimensioning, conventions and standards related to Engineering Drawing
- To impart knowledge on the projection of points, lines and plane surfaces
- To improve the visualization skills for better understanding of projection of solids
- To develop the imaginative skills of the students required to understand Section of solids and Developments of surfaces.
- To make the students understand the viewing perception of a solid object in Isometric and Perspective projections

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

<b>CO1</b>	Understand the principles of engineering drawing, including engineering curves, scales, orthographic and isometric projections. ( <b>Understand</b> )
<b>CO2</b>	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. ( <b>Apply</b> )
<b>CO3</b>	Understand and draw projection of solids in various positions in first quadrant. ( <b>Apply</b> )
<b>CO4</b>	Able to draw the development of surfaces of simple objects ( <b>Apply</b> )
<b>CO5</b>	Prepare isometric and orthographic sections of simple solids. ( <b>Apply</b> )

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

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

#### **TEXTBOOKS:**

**T1** N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

#### **REFERENCE BOOKS:**

**R1** Engineering Drawing, K.L. Narayana and P. Kanniah, Tata McGraw Hill, 2013.

**R2** Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc, 2009.

**R3** Engineering Drawing with an Introduction to AutoCAD, Dhananjay Jolhe, Tata McGraw Hill, 2017

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: INTRODUCTION TO ENGINEERING GRAPHICS, LETTERING, SCALES, CURVES.

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.	<b>Introduction</b> to CO's, PO's & Basics to Engineering Graphics	01	14.02.2024		<b>TLM1</b>	
2.	Basics of Engineering Graphics Geometrical constructions, regular polygons - general methods & <b>Scales</b>	02	16.02.2024		<b>TLM1</b>	
3.	Hands on practice session	02	16.02.2024		<b>TLM3</b>	
4.	<b>Curves</b> Construction of Ellipse, parabola & Hyperbola -theory	02	21.02.2024 23.02.2024		<b>TLM1</b>	
5.	Practice Session	03	23.02.2024		<b>TLM3</b>	
6.	Construction of cycloid -theory	01	28.02.2024		<b>TLM1</b>	
7.	Involutes-theory	01	01.03.2024		<b>TLM1</b>	
8.	Practice Session	03	01.03.2024		<b>TLM3</b>	
<b>No. of classes required to complete UNIT-I: 15</b>				<b>No. of classes taken:</b>		

#### UNIT-II: ORTHOGRAPHIC PROJECTIONS, PROJECTIONS OF STRAIGHT LINES & 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
9.	Projection of <b>points</b> , straight lines -theory	01	06.03.2024		<b>TLM1</b>	
10.	Projection of <b>straight lines</b> -inclined to VP/HP	01	13.03.2024		<b>TLM1</b>	
11.	Practice Session	04	15.03.2024		<b>TLM3</b>	
12.	Projection of straight lines -inclined to both planes - theory	01	20.03.2024		<b>TLM1</b>	
13.	Projection of <b>planes</b> - parallel to one & reference to other plane - theory	01	22.03.2024		<b>TLM1</b>	
14.	Practice Session	03	22.03.2024		<b>TLM3</b>	
15.	Projection of planes- inclined to both planes	01	27.03.2024		<b>TLM1</b>	
	<b>MID-1 Examination</b>		<b>01.04.2024-06.04.2024</b>			
<b>No. of classes required to complete UNIT-II: 12</b>				<b>No. of classes taken:</b>		

#### UNIT-III: PROJECTIONS OF SOLIDS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	Types of solids-theory	01	10.04.2024		<b>TLM1</b>	
17.	Projections of solids-theory	01	12.04.2024		<b>TLM1</b>	
18.	Practice Session	03	12.04.2024		<b>TLM3</b>	
19.	Projections of solids-axis inclined to VP/HP	01	19.04.2024		<b>TLM1</b>	
20.	Practice Session	03	19.04.2024		<b>TLM3</b>	
<b>No. of classes required to complete UNIT-III:09</b>				<b>No. of classes taken:</b>		

### 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
21.	Sections of solids- simple positions-theory	01	24.04.2024		TLM1	
22.	Sectional views & true shapes - theory	01	26.04.2024		TLM1	
23.	Practice Session	03	26.04.2024		TLM3	
24.	Parallel line development-theory	01	01.05.2024		TLM1	
25.	Radial line development-theory	01	03.05.2024		TLM1	
26.	Practice Session	03	03.05.2024		TLM3	
<b>No. of classes required to complete UNIT-IV: 10</b>				<b>No. of classes taken:</b>		

### 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	
27.	Isometric to Ortho views	01	08.05.2024		TLM1		
28.	Practice Session – Ortho views	04	10.05.2024		TLM3		
29.	Ortho to Isometric views	01	15.05.2024		TLM1		
30.	Practice Session	04	17.05.2024		TLM3		
31.	Revision	01	22.05.2024		TLM1		
32.	Practice Session - Revision	04	24.05.2024		TLM3		
33.	AutoCAD Basics-theory	01	29.05.2024		TLM1		
34.	Hands on practice session	04	31.05.2024		TLM1		
<b>MID - II Examination</b>		<b>03.06.2024 – 08.06.2024</b>					
<b>No. of classes required to complete UNIT-V: 20</b>				<b>No. of classes taken:</b>			

Teaching Learning Methods			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	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
<b>Mid Marks=80% of Max(M1,M2)+20%of Min((M1,M2)+Day to Day Evaluation</b>	<b>M=30</b>
<b>Cumulative Internal Examination(CIE):M</b>	<b>30</b>
<b>Semester End Examination(SEE)</b>	<b>70</b>
<b>Total Marks=CIE+SEE</b>	<b>100</b>

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
<b>Name of the Faculty</b>	Dr. V. Ramakrishna	Mr. J. Subba Reddy	Dr. M B S S Reddy	Dr. J. Venkateswara Rao
<b>Signature</b>				



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING**

(An Autonomous Institution since 2010)

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

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



**FRESHMAN ENGINEERING DEPARTMENT**

**COURSE HANDOUT**

**PART-A**

<b>PROGRAM</b>	<b>: I B.Tech., II-Sem., IT-B</b>
<b>ACADEMIC YEAR</b>	<b>: 2023-24</b>
<b>COURSE NAME &amp; CODE</b>	<b>: ENGINEERING PHYSICS</b>
<b>L-T-P STRUCTURE</b>	<b>: 3-0-0</b>
<b>COURSE CREDITS</b>	<b>3</b>
<b>COURSE INSTRUCTOR</b>	<b>: N. T. SARMA</b>
<b>PRE-REQUISITE</b>	<b>: Basic Knowledge of Physics</b>

**Course Objectives:**

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

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

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

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

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

## TEXT BOOKS

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

## REFERENCES

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

## WEB RESOURCES

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

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

## PART-B

### COURSE DELIVERY PLAN (LESSON PLAN):

#### UNIT-I: INTERFERENCE, DIFFRACTION & POLARIZATION

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	12/02/2024		TLM-2		
2.	Principle of superposition, Interference of light	1	15/02/2024		TLM-3		
3.	Interference in thin films by reflection & applications	1	16/02/2024		TLM-2		
4.	Colors in thin films, Newton's rings	1	17/02/2024		TLM-1		
5.	Determination of wavelength and refractive index	1	19/02/2024		TLM-4		
6.	Problems & Assignment/Quiz	1	22/02/2024		TLM-1		

7.	Introduction, Fresnel and Fraunhofer diffractions	1	23/02/2024		<b>TLM-3</b>		
8.	Fraunhofer diffraction due to single slit	1	24/02/2024		<b>TLM-2</b>		
9.	Double slit & N slits (Qualitative)	1	26/02/2024		<b>TLM-4</b>		
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	29/02/2024		<b>TLM-4</b>		
11.	Problems & Assignment/Quiz	1	01/03/2024		<b>TLM-3</b>		
12.	Introduction – Types of polarization	1	02/03/2024		<b>TLM-2</b>		
13.	Polarization by reflection, refraction & double refraction	1	04/03/2024		<b>TLM-2</b>		
14.	Nicol's prism	1	07/03/2024		<b>TLM-5</b>		
15.	Half wave and Quarter wave plates	1	09/03/2024		<b>TLM-2</b>		
16.	Problems & Assignment/Quiz	1	11/03/2024		<b>TLM-3</b>		
No. of classes required to complete UNIT-I: 16				No. of classes taken:			

### **UNIT-II: CRYSTALLOGRAPHY & X- RAY DIFFRACTION**

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	14/03/2024		<b>TLM-3</b>		
2.	Bravais Lattices Crystal Systems (3D)	1	15/03/2024		<b>TLM-2</b>		
3.	Coordination number – Packing fraction of –SC, BCC	1	16/03/2024		<b>TLM-1</b>		
4.	Coordination number – Packing fraction of FCC	1	18/03/2024		<b>TLM-1</b>		
5.	Miller indices & Properties	1	21/03/2024		<b>TLM-2</b>		

6.	Separation between successive (hkl) planes	1	22/03/2024		<b>TLM-1</b>	
7.	Bragg's law; X-ray Diffractometer	1	23/03/2024		<b>TLM-2</b>	
8.	Crystal Structure determination by Laue's method	1	28/03/2024		<b>TLM-5</b>	
9.	Crystal Structure determination by Powder method	1	30/03/2024		<b>TLM-5</b>	
10.	Problems & Assignment/Quiz	1	30/03/2024		<b>TLM-3</b>	
11.	MID-1 Examinations	1	01/04/2024			
12.	MID-1 Examinations	1	04/04/2024		----	
13.	MID-1 Examinations	1	06/04/2024		----	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

### **UNIT-III : DIELECTRIC & MAGNETIC MATERIALS**

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

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Basic definitions, Relation between the electric vectors.	1	08/04/2024		<b>TLM-2</b>		
2.	Types of polarizations- Electronic polarization	1	12/04/2024		<b>TLM-1</b>		
3.	Types of polarizations - ionic & orientation polarizations (Qualitative)	1	13/04/2024		<b>TLM-1</b>		
4.	Lorentz internal field	1	15/04/2024		<b>TLM-2</b>		
5.	Claussius-Mosotti equation, Complex dielectric constant	1	18/04/2024		<b>TLM-1</b>		
6.	Frequency dependence & dielectric loss	1	19/04/2024		<b>TLM-5</b>		
7.	Problems & Assignment/Quiz	1	20/04/2024		<b>TLM-3</b>		
8.	Basic definitions, Relations & Atomic origin of magnetic Moment.	1	22/04/2024		<b>TLM-4</b>		



9.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	25/04/2024		<b>TLM-2</b>	
10.	Domain concept for Ferromagnetism & Domain walls	1	26/04/2024		<b>TLM-2</b>	
11.	Hysteresis, soft and hard magnetic materials	1	27/04/2024		<b>TLM-5</b>	
12.	Problems & Assignment/Quiz	1	29/04/2024		<b>TLM-3</b>	
No. of classes required to complete UNIT-V: 12				No. of classes taken:		

### **UNIT-IV : QUANTUM MECHANICS & FREE ELECTRON THEORY**

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter, De-Broglie's Hypothesis	1	02/05/2024		<b>TLM-2</b>		Extra hour
2.	Heisenberg's Uncertainty Principle, Significance & properties of wave function	1	03/05/2024		<b>TLM-2</b>		
3.	Schrodinger's time independent and dependent wave equations	1	04/05/2024		<b>TLM-1</b>		
4.	Particle in a one – dimensional infinite potential well	1	06/05/2024		<b>TLM-1</b>		
5.	Problems & Assignment/Quiz	1	09/05/2024		<b>TLM-3</b>		
6.	Classical free electron theory- merits and demerits	1	10/05/2024		<b>TLM-2</b>		
8.	Quantum free electron theory Electrical conductivity	1	11/05/2024		<b>TLM-2</b>		
10.	Fermi -Dirac distribution and temperature dependence	1	13/05/2024		<b>TLM-5</b>		
11.	Density of states, Fermi energy	1	16/05/2024		<b>TLM-1</b>		
12.	Problems & Assignment/Quiz	1	17/05/2024		<b>TLM-3</b>		
No. of classes required to complete UNIT-III: 12				No. of classes taken:			

**UNIT-V : SEMICONDUCTOR PHYSICS****Course Outcome :- CO 5; Text Book :- T2, R1**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Formation of energy bands, classification of crystalline solids	1	18/05/2024		<b>TLM-6</b>		
2.	Intrinsic semiconductors, Density of charge carriers	1	20/05/2024		<b>TLM-1</b>		
3.	Electrical conductivity, Fermi level	1	23/05/2024		<b>TLM-2</b>		
4.	Extrinsic semiconductors, Density of charge carriers	1	24/05/2024		<b>TLM-1</b>		
5.	Dependence of Fermi energy on carrier concentration & temperature	1	25/05/2024		<b>TLM-2</b>		
6.	Drift and Diffusion Currents, Einstein's equation	1	27/05/2024		<b>TLM-1</b>		
7.	Hall Effect & its applications	1	30/05/2024		<b>TLM-4</b>		
8.	Problems & Assignment/Quiz	1	31/05/2024		<b>TLM-3</b>		
9.	MID-2 Examinations	1	03/06/2024		----		
10.	MID-2 Examinations	1	06/06/2024		----		
11.	MID-2 Examinations	1	07/06/2024		----		
12.	MID-2 Examinations	1	08/06/2024		----		
No. of classes required to complete UNIT-IV: 08				No. of classes taken:			

**PART-C**

**EVALUATION PROCESS (R-23 Regulation)**

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

## **PART-D**

### **PROGRAMME OUTCOMES (POs):**

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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

**N. T. SARMA**

**Dr. S. YUSUF**

**Dr. S. YUSUF**

**Dr. A. RAMI REDDY**



# 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 INFORMATION TECHNOLOGY

### COURSE HANDOUT

#### PART-A

**Name of Course Instructor(s):** Mr. Sk. Nazumuddin(T684)/Mr. S.Indrasena Reddy(T561)/  
Mr. G.V Suryanarayana(T786)

<b>Course Name &amp; Code</b> : Engineering Graphics – 23ME01	<b>Regulations</b> : R23
<b>L-T-P Structure</b> : 2-0-2	<b>Credits</b> : 03
<b>Program/Sem/Sec</b> : B.Tech/II SEM IT - A Section	<b>A.Y.</b> : 2023-24
<b>PREREQUISITE</b> : Engineering Physics, Mathematics	

#### **COURSE EDUCATIONAL OBJECTIVES (CEOs):**

- To enable the students with various concepts like dimensioning, conventions and standards related to Engineering Drawing
- To impart knowledge on the projection of points, lines and plane surfaces
- To improve the visualization skills for better understanding of projection of solids
- To develop the imaginative skills of the students required to understand Section of solids and Developments of surfaces.
- To make the students understand the viewing perception of a solid object in Isometric and Perspective projections.

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

<b>CO1</b>	Understand the principles of engineering drawing, including engineering curves, scales, Orthographic and isometric projections. ( <b>Understanding Level –L2</b> )
<b>CO2</b>	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. ( <b>Applying Level –L3</b> )
<b>CO3</b>	Understand and draw projection of solids in various positions in first quadrant. ( <b>Apply –L3</b> )
<b>CO4</b>	Able to draw the development of surfaces of simple objects. ( <b>Applying Level –L3</b> )
<b>CO5</b>	Prepare isometric and orthographic sections of simple solids. ( <b>Applying Level –L3</b> )

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
<b>CO1</b>	3	2	2	-	-	-	-	-	-	-	-	3	2	1	2
<b>CO2</b>	3	2	1	-	-	-	-	-	-	-	-	3	1	1	2
<b>CO3</b>	3	2	2	-	-	-	-	-	-	-	-	3	-	1	2
<b>CO4</b>	3	2	2	-	-	-	-	-	-	-	-	3	2	1	2
<b>CO5</b>	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

## COURSE DELIVERY PLAN (LESSON PLAN)

### PART-B

#### UNIT - I: INTRODUCTION, GEOMETRICAL CONSTRUCTIONS, SCALES, 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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
01	Introduction to Engineering Graphics: COs, CEOs, POs and PEOs <b>UNIT I:</b> <b>INTRODUCTION:</b> Introduction to Engineering Drawing, Principles of Engineering Graphics, and their Significance	2	14-02-2024		TLM 1, 2	CO 1	T1, R1 to R5	
02	Drawing Instruments and their use-Conventions in Drawing, Lines, Lettering, and Dimensioning – BIS Conventions, Practice	3	19-02-2024		TLM 1, 2, 3	CO 1	T1, R1 to R5	
03	<b>Geometrical Constructions</b> and Constructing regular polygons by general methods, <b>Scales:</b> Plain scales, diagonal scales, and vernier scales	2	21-02-2024		TLM 1, 2	CO 1	T1, R1 to R5	
04	Engineering <b>Curves:</b> Conic Sections, Construction of Ellipse, Parabola, and Hyperbola by general method only	3	26-02-2024		TLM 1, 2, 3	CO 1	T1, R1 to R5	
05	Construction of Cycloids, Involutives, Normal and tangent to Curves, Practice	2	28-02-2024		TLM 1, 2	CO 1	T1, R1 to R5	
06	<b>Orthographic Projections:</b> Reference plane, importance of reference lines or Plane	3	04-03-2024		TLM 3	CO 1	T1, R1 to R5	
07	Projections of a point situated in any one of the four quadrants, Practice	2	06-03-2024		TLM 1, 2	CO 1	T1, R1 to R5	
<b>No. of classes required to complete UNIT - I:</b> 17 (Lecture:08 Practice: 09)			<b>No. of classes taken (including Practice):</b>					

## UNIT-II: PROJECTIONS OF STRAIGHT LINES AND PLANES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
08	<b>Projections of straight lines:</b> Projections of straight lines parallel to both reference planes, perpendicular to one reference plane, and parallel to other reference planes, Practice	3	11-03-2024		TLM 1, 2	CO 2	T1, R1 to R5	
09	Projections of lines inclined to one reference plane and parallel to the other reference plane	2	13-03-2024		TLM 1, 2, 3	CO 2	T1, R1 to R5	
10	Projections of Straight Line Inclined to both the reference planes, Practice	3	18-03-2024		TLM 1, 2	CO 2	T1, R1 to R5	
11	<b>Projections of Planes:</b> Projections of Regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane, Practice	2	20-03-2024		TLM 1, 2, 3	CO 2	T1, R1 to R5	
12	Projections of planes inclined to both the reference planes, Practice	3	27-03-2024		TLM 1, 2	CO 2	T1, R1 to R5	
-	<b>I Mid Examinations: From 01-04-2024 to 06-04-2024 (Covered CO 1 &amp; CO 2)</b>							
<b>No. of classes required to complete UNIT - II: 14 (Lecture:05 Practice: 08)</b>			<b>No. of classes taken (including Practice):</b>					

## 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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
13	Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to HP, Practice	3	08-04-2024		TLM 1, 2, 3	CO 3	T1, R1 to R5	
14	Projections of solids in simple positions: Axis perpendicular to vertical plane and Axis parallel to both the reference planes	3	15-04-2024		TLM 1, 2	CO 3	T1, R1 to R5	
15	Projection of Solids with axis inclined to one reference plane and parallel to another plane, Practice	3	22-04-2024		TLM 1, 2, 3	CO 3	T1, R1 to R5	
16	Numericals	2	24-04-2024		TLM 1, 2	CO 3	T1, R1 to R5	
<b>No. of classes required to complete UNIT - III: 13 (Lecture:05 Practice: 06)</b>			<b>No. of classes taken (including Practice):</b>					

**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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
17	Introduction to Sections of Solids and Development of Surfaces: Perpendicular and inclined section planes	2	01-05-2024		TLM 1, 2	CO 4	T1, R1 to R5	
18	Sectional views and True shape of section, Practice	3	06-05-2024		TLM 1, 2, 3	CO 4	T1, R1 to R5	
19	Sections of solids in simple position only, Numericals	2	08-05-2024		TLM 1, 2	CO 4	T1, R1 to R5	
20	<b>Development of Surfaces:</b> Introduction to Methods of Development of Surfaces, Parallel Line Development (Plane Surfaces), Practice	3	13-05-2024		TLM 1, 2, 3	CO 4	T1, R1 to R5	
21	Radial Line Development, Numericals	2	15-05-2024		TLM 1, 2, 3	CO 4	T1, R1 to R5	
<b>No. of classes required to complete UNIT - IV: 15 (Lecture:06 Practice: 06)</b>			<b>No. of classes taken (including Practice):</b>					

**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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
22	Introduction to Isometric Views, Conversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views	3	20-05-2024		TLM 1, 2	CO 5	T1, R1 to R5	
23	Practice	2	22-05-2024		TLM 1, 2, 3	CO 5	T1, R1 to R5	
24	Practice	3	27-05-2024		TLM 1, 2	CO 5	T1, R1 to R5	
25	<b>Computer Graphics:</b> Creating 2D&3D drawings of objects, including PCB and Transformations using Auto CAD	2	29-05-2024		TLM 1, 2, 3	CO 5	T1, R1 to R5	
<b>No. of classes required to complete UNIT - V: 10 (Lecture:04 Practice: 06)</b>			<b>No. of classes taken (including Practice):</b>					
<b>II Mid Examinations: From 01-04-2024 to 06-04-2024 (Covered CO 3, CO 4 &amp; CO 5)</b>								

**Teaching Learning Methods:**

<b>TLM1:</b> Chalk and Talk	<b>TLM2:</b> PPT	<b>TLM3:</b> Tutorial	<b>TLM4:</b> Demonstration (Lab/Field Visit)
<b>TLM5:</b> ICT (NPTEL/Swayam Prabha/MOOCs)		<b>TLM6:</b> Group Discussion/Project	



**PART-C**

**EVALUATION PROCESS for EG Course (R23 Regulation):**

<b>Evaluation Task</b>	<b>Marks</b>
I - Descriptive Examination (Units - I, II)	M1=15
II- Descriptive Examination (UNITs - III, IV & V)	M2=15
Day – to – Day Evaluation (UNITs - I, II, III, IV & V)	DDE=15
Mid Marks for 80% of Max (M1, M2) + 20% of Min (M1, M2)	M=15
Cumulative Internal Examination (CIE): M+ DDE	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

**ACADEMIC CALENDER - B.Tech - II Semester (R23):**

<b>Commencement of Class work</b>		<b>12-02-2024</b>	
<b>Description</b>	<b>From</b>	<b>To</b>	<b>Weeks</b>
I Phase of Instructions	12-02-2024	06-04-2024	8 Weeks
I Mid Examinations	01-04-2024	06-04-2024	1 Week
II Phase of Instructions	08-04-2024	01-06-2024	8 Weeks
II Mid Examinations	03-06-2024	08-06-2024	1 Week
Preparation and Practicals	10-06-2024	15-06-2024	1 Week
Semester End Examinations	17-06-2024	29-06-2024	1 Week
<b>Commencement of Next (III) Semester Class Work</b>		<b>01-07-2024</b>	

**Class Time Table - B.Tech – II Sem: IT Section – A(R23)**

↓Day/Date→	09.00 – 09.50	09.50 - 10.40	10.50 - 11.40	11.40 - 12.30	12.30 - 13.30	13.30 - 14.20	14.20 - 15.10	15.10 - 16.00
<b>Monday</b>					<b>LUNCH BREAK</b>	<b>EG</b>		
<b>Tuesday</b>								
<b>Wednesday</b>			<b>EG</b>					
<b>Thursday</b>								
<b>Friday</b>								
<b>Saturday</b>								

## Day – to – Day work / Submission of Sheets

S.No	Unit No	Course Outcome	Sheet No. and Content
1	I	CO 1	1. Lines, Lettering and Dimensioning, Geometrical Constructions (Practice) 2. Engineering Curves: Ellipse, Parabola, Hyperbola 3. Construction of Cycloids, involutes 4. Projections of Points
2	II	CO 2	5. Projections of straight lines – 1 (basic positions) 6. Projections of straight lines – 2 (inclined to both planes) 7. Projections of Planes
3	III	CO 3	8. Projections of Solids – 1 (Resting on HP or VP) 9. Projections of Solids – 2 (Axis inclined to one plane and parallel to the other)
4	IV	CO 4	10. Sections of Solids 11. Development of Surfaces
5	V	CO 5	12. Isometric views of planes and simple solids 13. conversion of Isometric views to Orthographic Projections 14. Conversion of Orthographic Projections to Isometric Views

### PART-D

#### **Program Educational Objectives (PEOs):**

**PEO1** Pursue a successful career in the area of Information Technology or its allied fields.

**PEO2** Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.

**PEO3** Able to demonstrate self-learning, life-long learning, and work in teams on multidisciplinary projects.

**PEO4** Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, teamwork, and leadership skills in their job.

#### **Program 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

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

**Program Specific Outcomes (PSOs):**

- PSO1** Organize, Analyze and Interpret the data to extract meaningful conclusions.
- PSO2** Design, Implement and Evaluate a computer-based system to meet desired needs.
- PSO3** Develop IT application services with the help of different current engineering tools.

<b>Signature</b>				
<b>Name of the Faculty</b>	Mr. Nazumuddin Shaik	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. P. Lovaraju
<b>Title</b>	<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HoD ASE</b>



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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Phone: 08659-222933, Fax: 08659-222931

## DEPARTMENT OF ECE

### COURSE HANDOUT

#### PART-A

<b>Name of Course Instructor:</b> Mr. P. James Vijay	<b>Date:</b> 15-02-2024
<b>Course Name &amp; Code</b> : Basic Electrical & Electronics Engineering – 23EE01	
<b>L-T-P Structure</b> : 3-0-0	<b>Credits:</b> 3
<b>Program/Sem./Sec.</b> : B.Tech/II/IT-B	<b>A.Y.:</b> 2023-24
	<b>Regulation:</b> 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. <b>(Understand)</b>
CO2	Understand the operation of electrical machines and measuring instruments. <b>(Understand)</b>
CO3	Classify various energy resources, safety measures and interpret electricity bill generation in electrical systems. <b>(Understand)</b>
PART-B: BASIC ELECTRONICS ENGINEERING	
CO4	Interpret the characteristics of various semiconductor devices <b>(Knowledge)</b>
CO5	Infer the operation of rectifiers, amplifiers. <b>(Understand)</b>
CO6	Contrast various logic gates, sequential and combinational logic circuits. <b>(Understand)</b>

**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:

- Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
- Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
- 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. Bhattacharya, 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 B: BASIC ELECTRONICS ENGINEERING

##### UNIT-I: Semiconductor Devices

Sl.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction – Course Outcomes	1	12-02-2024		TLM1	
2.	Evolution of electronics, Vacuum tubes to nano electronics	1	14-02-2024		TLM1	
3.	Characteristics of PN Junction Diode	1	15-02-2024		TLM1	
4.	Zener Effect — Zener Diode and its Characteristics	1	16-02-2024		TLM1	
5.	Zener Effect — Zener Diode and its Characteristics	1	17-02-2024		TLM1	
6.	Bipolar Junction Transistor	1	19-02-2024		TLM1	
7.	Bipolar Junction Transistor	1	21-02-2024		TLM1	
8.	CB Configurations and Characteristics	1	22-02-2024		TLM2	
9.	CE Configurations and Characteristics.	1	23-02-2024		TLM2	
10.	CC Configurations and Characteristics.	1	24-02-2024		TLM2	
11.	Elementary Treatment of Small Signal CE Amplifier.	1	26-02-2024		TLM1	
<b>No. of classes required to complete UNIT-I: 11</b>				<b>No. of classes taken:</b>		

##### UNIT-II: Basic Electronic Circuits and Instrumentation

Sl.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	<b>Rectifiers and power supplies:</b> Block diagram description of a DC power supply	1	28-02-2024		TLM1	
13.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	29-02-2024		TLM1	
14.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	01-03-2024		TLM1	
15.	Working of simple Zener voltage regulator.	1	02-03-2024		TLM1	
16.	Working of simple Zener voltage regulator.	1	06-03-2024		TLM2	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	<b>Amplifiers:</b> Block diagram of Public Address system	1	07-03-2024		TLM1	
18.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	07-03-2024		TLM2	
19.	<b>Electronic Instrumentation:</b> Block diagram of an electronic instrumentation system.	1	11-03-2024		TLM2	
20.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	13-03-2024		TLM2	
<b>No. of classes required to complete UNIT-II: 9</b>				<b>No. of classes taken:</b>		

### 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
21.	Overview of Number Systems	1	14-03-2024		TLM1	
22.	Logic gates including Universal Gates	1	15-03-2024		TLM2	
23.	BCD codes	1	16-03-2024		TLM1	
24.	Excess-3 code, gray code	1	18-03-2024		TLM2	
25.	Hamming code	1	20-03-2024		TLM1	
26.	Boolean Algebra	1	21-03-2024		TLM1	
27.	Basic Theorems and properties of Boolean Algebra	1	22-03-2024		TLM1	
28.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	23-03-2024		TLM1	
29.	Simple combinational circuits	1	26-03-2024		TLM2	
30.	Half and Full Adders	1	26-03-2024		TLM1	
31.	Introduction to sequential circuits	1	27-03-2024		TLM2	
32.	Flip flops	1	28-03-2024		TLM2	
33.	Registers and counters	1	30-03-2024		TLM1	
<b>No. of classes required to complete UNIT-III: 13</b>				<b>No. of classes taken:</b>		

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

### 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
34.	Introduction to Course and Course Outcomes	1	08-04-2024		TLM1	
35.	<b>DC Circuits:</b> Electrical circuit elements (R, L and C)	1	10-04-2024		TLM1	
36.	Ohm's Law and its limitations	1	12-04-2024		TLM1	
37.	KCL & KVL	1	15-04-2024		TLM2	
38.	Series, Parallel, series-parallel circuits	1	18-04-2024		TLM1	
39.	Superposition theorem	1	19-04-2024		TLM1	
40.	<b>AC Circuits:</b> A.C. Fundamentals:	1	20-04-2024		TLM1	
41.	Equation of AC Voltage and current, waveform	1	22-04-2024		TLM1	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	24-04-2024		TLM1	
43.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	25-04-2024		TLM1	
44.	Concept of Impedance, Active power, reactive power and apparent power	1	26-04-2024		TLM2	
45.	Concept of power factor (Simple Numerical problems).	1	27-04-2024		TLM1	
<b>No. of classes required to complete UNIT-I: 12</b>				<b>No. of classes taken:</b>		

### 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
46.	<b>Machines:</b> Construction, principle and operation of DC Motor	1	29-04-2024		TLM1	
47.	Construction, principle and operation of DC Generator	1	01-05-2024		TLM2	
48.	Construction, principle and operation of Single-Phase Transformer	1	02-05-2024		TLM2	
49.	Construction, principle and operation of Three Phase Induction Motor	1	03-05-2024		TLM2	
50.	Construction, principle and operation of Alternator	1	04-05-2024		TLM1	
51.	Applications of electrical machines	1	06-05-2024		TLM1	
52.	<b>Measuring Instruments:</b> Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	08-05-2024		TLM2	
53.	Moving Iron (MI) Instruments	1	09-05-2024		TLM2	
54.	Wheatstone Bridge	1	10-05-2024		TLM1	
<b>No. of classes required to complete UNIT-II: 09</b>				<b>No. of classes taken:</b>		

### 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
55.	<b>Energy Resources:</b> Conventional and non-conventional energy resources	1	11-05-2024		TLM1	
56.	Layout and operation of various Power Generation systems: Hydel power generation	1	13-05-2024		TLM1	
57.	Layout and operation of nuclear power generation	1	15-05-2024		TLM1	
58.	Layout and operation of Solar power generation	1	16-05-2024		TLM1	
59.	Layout and operation of Wind power generation.	1	17-05-2024		TLM1	

Sl.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
60.	<b>Electricity bill:</b> Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc.	1	18-05-2024		TLM1	
61.	Definition of “unit” used for consumption of electrical energy,	1	20-05-2024		TLM1	
62.	Two-part electricity tariff	1	22-05-2024		TLM1	
63.	Calculation of electricity bill for domestic consumers	1	23-05-2024		TLM1	
64.	<b>Equipment Safety Measures:</b> Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits.	1	24-05-2024		TLM1	
65.	<b>Equipment Safety Measures:</b> Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits.	1	25-05-2024		TLM1	
66.	<b>Personal Safety Measures:</b> Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	27-05-2024		TLM2	
67.	<b>Personal Safety Measures:</b> Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	29-05-2024		TLM2	
68.	Introduction to Oscillators Content Beyond Syllabus	1	30-05-2024		TLM2	
69.	Revision of I, II and III Units	1	31-05-2024		TLM6	
70.	Quiz on I, II and III Units	1	01-06-2024		TLM6	
<b>No. of classes required to complete UNIT-III: 16</b>				<b>No. of classes taken:</b>		

**II Mid Examinations: 03-06-2024 to 08-06-2024**

<b>Teaching Learning Methods</b>			
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Demonstration (Lab/Field Visit)
<b>TLM2</b>	PPT	<b>TLM5</b>	ICT (NPTEL/Swayam Prabha/MOOCs)
<b>TLM3</b>	Tutorial	<b>TLM6</b>	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	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	<b>Problem analysis:</b> 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	<b>Design/development of solutions:</b> 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	<b>Conduct investigations of complex problems:</b> 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	<b>Modern tool usage:</b> 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	<b>The engineer and society:</b> 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	<b>Environment and sustainability:</b> 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	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	<b>Communication:</b> 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.

<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):**

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

**Course Instructor**

Mr. P. James Vijay

**Course Coordinator**

Dr. P. Rakesh Kumar

**Module Coordinator**

Dr. G. Srinivasulu

**Head of the Department**

Dr. Y. Amar Babu



## FRESHMAN ENGINEERING DEPARTMENT COURSE HANDOUT

### Part-A

<b>PROGRAM</b>	: <b>B.Tech., I-Sem., IT-B</b>
<b>ACADEMIC YEAR</b>	: <b>2023-24</b>
<b>COURSE NAME &amp; CODE</b>	: <b>ENGINEERING PHYSICS LAB</b>
<b>L-T-P STRUCTURE</b>	: <b>0 – 0 – 2</b>
<b>COURSE CREDITS</b>	: <b>1</b>
<b>COURSE INSTRUCTOR</b>	: <b>N. T. SARMA / Dr. N. Aruna</b>
<b>COURSE COORDINATOR</b>	: <b></b>

**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 moduli 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
<b>1 = slight (Low)                      2 = Moderate ( Medium)                      3 = Substantial ( High)</b>												

## List of Experiments

1. Determination of radius 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.

### BOS APPROVED TEXT BOOKS:

1. Lab Manual Prepared by the LBRCE.

### EVALUATION PROCESS:

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

**Part-B**

**COURSE DELIVERY PLAN (LESSON PLAN): CIVIL**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
1.	Introduction & Demonstration	3	12/02/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
2.	Experiment 1	3	19/02/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
3.	Experiment 2	3	26/02/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
4.	Experiment 3	3	04/03/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
5.	Experiment 4	3	11/03/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
6.	Experiment 5	3	18/03/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
7.	<b>MID-1 Exam</b>	3	01/04/2024		---	---	---	
8.	Experiment 6	3	08/04/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
9.	Experiment 7	3	15/04/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
10.	Experiment 8	3	22/04/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
11.	Experiment 8	3	29/04/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
12.	Experiment 9	3	06/05/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
13.	Experiment 10	3	13/05/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
14.	Experiment 10	3	20/05/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	T1	
15.	<b>Internal Exam</b>	3	27/05/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	---	
16.	<b>Internal Exam</b>	3	27/05/2024		<b>TLM-4</b>	CO1, CO2, CO3, CO4 & CO5	---	
17.	<b>MID-2 Exam</b>	3	03/06/2024		---	---	---	
No. of classes required to complete lab		14			No. of classes taken:			

**PROGRAM OUTCOMES:** Engineering Graduates will be able to:

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

Course Instructor

Course Coordinator

Module Coordinator

H.O.D

**N. T. SARMA**

**Dr. S. YUSUF**

**Dr. S. YUSUF**

**Dr. A. RAMIREDDY**