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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM : B. Tech., II-Sem., **AIML-A**

ACADEMIC YEAR : 2023-2024

COURSE NAME & CODE : Engineering Physics-23FE04

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

COURSE CREDITS : 3

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

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

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

Course Outcomes:

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

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

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

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

BoS APPROVED TEXT BOOKS:

TEXT BOOKS

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

REFERENCES

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): AIML-A

UNIT-I : Interference and diffraction

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Course Outcomes INTERFERENCE: Introduction	1	12-02-2024		TLM1	CO1	T1	
2.	Principle of superposition	1	14-02-2024		TLM1	CO1	T1	
3.	Interference of light, Interference in thin films by reflection reflection & applications	1	15-02-2024		TLM2	CO1	T1	
4.	colors in thin films	1	17-02-2024		TLM1	CO1	T1	
5.	Newton's rings	1	19-02-2024		TLM1	CO1	T1	
6.	ination of wavelength active index.	1	21-02-2024		TLM1	CO1	T1	
7.	DIFFRACTION: Introduction,	1	22-02-2024		TLM1	CO1	T1	
8.	Fresnel and Fraunhoffer diffractions	1	24-02-2024		TLM2	CO1	T1	
No. of classes required to complete UNIT-I		8			No. of classes taken:			

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
9.	Fraunhoffer diffraction due to single slit,	1	26-02-2024		TLM1	CO1	T1	
10.	double slit & N slits (Qualitative)	1	28-02-2024		TLM1	CO1	T1	
11.	Diffraction Grating, Dispersive power	1	29-02-2024		TLM2	CO1	T1	
12.	Resolving power of Grating(Qualitative)	1	02-03-2024		TLM1	CO1	T1	
13.	Polarization : Introduction	1	04-03-2024		TLM1	CO1	T1	
14.	Types of polarization	1	06-03-2024		TLM1	CO1	T1	
15.	Polarization by reflection	1	07-03-2024		TLM1	CO1	T1	
16.	refraction & double refraction	1	09-03-2024		TLM2	CO1	T1	
17.	Nicol's prism	1	11-03-2024		TLM1	CO1	T1	
18.	half wave and quarter wave plates	1	13-03-2024		TLM1	CO1	T1	
No. of classes required to complete UNIT-II		10			No. of classes taken:			

UNIT – II: Crystallography & X– ray Diffraction

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
19	Crystallography, Space lattice; Basis, Unit cell	1	14-03-2024		TLM1	CO2	T1	
20	Lattice parameters, Bravais Lattices	1	16-03-2024		TLM2	CO2	T1	
21	Crystal Systems (3D)- Coordination number, Packing fraction of -SC	1	18-03-2024		TLM1	CO2	T1	
22	BCC, FCC	1	20-03-2024		TLM1	CO2	T1	
23	ndices, separation between ve (hkl) planes.	1	21-03-2024		TLM2	CO2	T1	
24	X–ray diffraction: Bragg's law; X–ray Diffractometer,	1	23-03-2024		TLM1	CO2	T1	
25	tructure determination by vder methods.	1	27-03-2024		TLM1	CO2	T1	

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

UNIT – III : DIELECTRIC & MAGNETIC MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	DIELECTRIC MATERIALS: Introduction	1	08-04-2024		TLM1	CO3	T1	
34.	Dielectric polarization- Dielectric polarizability, Susceptibility, Dielectric constant & Displacement Vector	1	10-04-2024		TLM2	CO3	T1	
35.	Relation between the electric vectors	1	13-04-2024		TLM1	CO3	T1	
36.	Types of polarizations- Electronic (Quantitative), ionic (Quantitative) & orientation polarizations (Qualitative)	1	15-04-2024		TLM2	CO3	T1	
37.	Lorentz internal field	1	18-04-2024		TLM1	CO3	T1	

38.	Claussius-Mosotti equation	1	20-04-2024		TLM2	CO3	T1	
39.	ex dielectric constant – cy dependence of polariz tric loss.	1	22-04-2024		TLM1	CO3	T1	
40.	MAGNETIC MATERIALS : Introduction:	1	24-04-2024		TLM2	CO3	T1	
41.	Magnetic dipole moment – Magnetization- Magnetic susceptibility & permeability	1	25-04-2024		TLM2	CO3	T1	
42.	Atomic origin of magnetism	1	27-04-2024		TLM2	CO3	T1	
43.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	29-04-2024		TLM1	CO3	T1	
44.	Domain concept for Ferromagnetism & Domain walls	1	01-05-2024		TLM2	CO3	T1	
45.	Hysteresis – soft and hard magnetic materials	1	02-05-2024		TLM2	CO3	T1	
No. of classes required to complete UNIT-IV		14			No. of classes taken: 14			

UNIT – IV: QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
46.	QUANTUM MECHANICS: Dual nature of matter- Heisenberg's Uncertainty Principle	1	04-05-2024		TLM1	CO4	T1	
47.	significance & properties of wave function	1	06-05-2024		TLM2	CO4	T1	
48.	Schrodinger's time independent and dependent wave equations	1	08-05-2024		TLM2	CO4	T1	
49.	in a one –dimensional i l well.	1	09-05-2024		TLM1	CO4	T1	

50.	FREE ELECTRON THEORY: Classical free electron theory (Qualitative with discussion of merits and demerits)	1	11-05-2024		TLM2	CO4	T1	
51.	Quantum free electron theory	1	13-05-2024		TLM1	CO4	T1	
52.	electrical conductivity based on quantum free electron theory	1	15-05-2024		TLM2	CO4	T1	
53.	Fermi -Dirac distribution	1	16-05-2024		TLM2	CO4	T1	
54.	Density of states – Fermi energy	1	18-05-2024		TLM1	CO4	T1	
	V: SEMI CONDUCTORS							
55.	SEMI CONDUCTORS: Formation of energy bands	1	20-05-2024		TLM2	CO5	T1	
56.	classification of crystalline solids- Intrinsic semiconductors	1	22-05-2024		TLM1	CO5	T1	
57.	Density of charge carriers- Electrical conductivity- Fermi level -Extrinsic semiconductors	1	23-05-2024		TLM1	CO5	T1	
58.	Density of charge carriers	1	25-05-2024		TLM1	CO5	T1	
59.	dependence of Fermi energy on carrier concentration and temperature	1	27-05-2024		TLM1	CO5	T1	
60.	Drift and Diffusion Currents	1	29-05-2024		TLM1	CO5	T1	
61.	Einstein's equation	1	30-05-2024		TLM2	CO5	T1	
62.	ect & its applications.	1	01-06-2024		TLM1	CO5	T1	

No. of classes required to complete UNIT-V		7			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
63.	SEM	1	30-05-2024		TLM1		R1	
64.	Conventional energy sources	1	01-06-2024		TLM1		R1	
75	Mid II	1	03-06-2024			CO3, CO4, CO5		
76	Mid II	1	04-06-2024			CO3, CO4, CO5		
77	Mid II	1	05-06-2024			CO3, CO4, CO5		
78	Mid II	1	06-06-2024			CO3, CO4, CO5		
79	Mid II	1	06-06-2024			CO3, CO4, CO5		
80	Mid II	1	08-06-2024			CO3, CO4, CO5		
81	Preparation and Practicals	10-06-2024 to 15-06-2024						
82	Semester end examinations	17-06-2024to 29-06-2024						

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

Part - C

EVALUATION PROCESS:

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

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

Graduates of Information Technology programme will be:

PEO 1: Pursue a successful career in the area of Information Technology or its allied fields.
PEO 2: Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.
PEO 3: Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.
PEO 4: Able to understand the professional code of ethics and demonstrate ethical behaviour, effective communication, team work and leadership skills in their job.

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

Graduate of the Information Technology will have the ability to

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

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

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSM - A
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** K. N. V. Lakshmi
COURSE COORDINATOR	**:** Dr.
PRE-REQUISITES	**:** Basics of Vectors**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

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

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	05-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	06-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	11-03-2024		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	11-03-2024		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	12-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	13-03-2024		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	18-03-2024		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	19-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	20-03-2024		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.	Simple Harmonic motion	1	27-03-2024		TLM1	CO1	T1,T2	
32.	TUTORIAL - II	1	30-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Introduction to UNIT IV	1	23-04-2024		TLM1	CO3	T1,T2	
43.	Vector Differentiation	1	24-04-2024		TLM1	CO3	T1,T2	
44.	Gradient	1	27-04-2024		TLM1	CO3	T1,T2	
45.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	

46.	Directional Derivative	1	29-04-2024		TLM1	CO3	T1,T2	
47.	Divergence	1	30-04-2024		TLM1	CO3	T1,T2	
48.	Curl	1	01-05-2024		TLM1	CO3	T1,T2	
49.	Problems	1	04-05-2024		TLM1	CO3	T1,T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	06-05-2024		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	07-05-2024		TLM1	CO3	T1,T2	
53.	Vector Identities	1	08-05-2024		TLM1	CO3	T1,T2	
54.	TUTORIAL IV	1	13-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		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	13-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	14-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	15-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	18-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	20-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	21-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	22-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	25-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Theorem	1	27-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	28-05-2024		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	27-05-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	2	29-05-2024 01-06-2024		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

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

Pre-requisites: Physics
Course Educational Objective:

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

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

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

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

Textbooks:

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DC & AC CIRCUITS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Electrical circuit elements	1	13-02-2024		TLM1	
2.	Ohm's Law and its limitations	1	14-02-2024		TLM1	
3.	KCL & KVL	1	15-02-2024		TLM1	
4.	series, parallel, series-parallel circuits	1	15-02-2024		TLM1	
5.	Problems	1	19-02-2024		TLM1	
6.	Super Position theorem	1	20-02-2024		TLM1	
7.	Problems	1	21-02-2024		TLM1	
8.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	22-02-2024		TLM2	
9.	average value, RMS value, form factor, peak factor	1	22-02-2024		TLM1	
10.	RLC Circuits	1	26-02-2024		TLM1	
11.	Impedance, Power	1	27-02-2024		TLM1	
12.	Problems	1	28-02-2024		TLM1	
13.	Problems	1	29-02-2024		TLM1	
No. of classes required to complete UNIT-I: 13				**No. of classes taken:**		

UNIT – II: MACHINES AND MEASURING INSTRUMENTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
14.	Construction, principle and operation of (i) DC Motor, (ii) DC Generator.	1	29-02-2024		TLM2	
15.	Single Phase Transformer	1	04-03-2024		TLM2	
16.	Three Phase Induction Motor	1	05-03-2024		TLM2	
17.	Alternator	1	06-03-2024		TLM2	
18.	Applications of electrical machines	1	07-03-2024		TLM2	
19.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	07-03-2024		TLM2	
20.	Moving Iron (MI) Instruments	1	11-03-2024		TLM2	
21.	Wheat Stone bridge	1	12-03-2024		TLM2	
22.	Problems	1	13-03-2024		TLM2	
No. of classes required to complete UNIT-II: 09				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23.	Conventional and non-conventional energy resources	1	14-03-2024		TLM2	
24.	Hydel power generation	1	14-03-2024		TLM2	
25.	Nuclear power plant	1	18-03-2024		TLM2	
26.	Solar & Wind power plants	1	19-03-2024		TLM2	
27.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	20-03-2024		TLM2	
28.	Definition of "unit" used for	1	21-03-2024		TLM2	

	consumption of electrical energy, two-part electricity tariff,					
29.	calculation of electricity bill for domestic consumers.	1	21-03-2024		TLM2	
30.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	26-03-2024		TLM2	
31.	Personal safety measures: Electric Shock	1	27-03-2024		TLM2	
32.	Earthing and its types	1	28-03-2024		TLM2	
33.	Safety Precautions to avoid shock.	1	28-03-2024		TLM2	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT – IV: SEMICONDUCTOR DEVICES

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

UNIT – V: BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Introduction	1	25-04-2024		TLM1	
45.	Block diagram description of a dc power supply.	1	29-04-2024		TLM1	
46.	working of a full wave bridge rectifier	1	30-04-2024		TLM1	
47.	capacitor filter	1	01-05-2024		TLM1	
48.	working of simple zener voltage regulator	1	02-05-2024		TLM1	
49.	Block diagram of Public Address system	1	02-05-2024		TLM1	
50.	Circuit diagram and working of common emitter (RC coupled) amplifier	1	06-05-2024		TLM1	
51.	Frequency response.	1	07-05-2024		TLM1	
52.	Electronic Instrumentation	1	08-05-2024		TLM1	
53.	Block diagram of an electronic instrumentation system	1	09-05-2024		TLM1	
No. of classes required to complete UNIT-V: 10				**No. of classes taken:**		

UNIT – VI: DIGITAL ELECTRONICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
54.	Overview of Number Systems	1	09-05-2024		TLM2	
55.	Conversion of Number system	1	13-05-2024		TLM2	
56.	Logic gates	1	14-05-2024		TLM1	
57.	BCD & XS-3 code	1	15-05-2024		TLM2	
58.	Gray and Hamming code	1	16-05-2024		TLM1	
59.	Basic theorems	1	16-05-2024		TLM2	
60.	Properties of Boolean Algebra	1	20-05-2024		TLM1	
61.	Logic diagrams using logic gates only	1	21-05-2024		TLM2	
62.	Combinational Vs Sequential circuits	1	22-05-2024		TLM1	
63.	Half adder	1	23-05-2024		TLM1	
64.	Full adder	1	23-05-2024		TLM1	
65.	Introduction to sequential circuits,	1	27-05-2024		TLM1	
66.	Flip flops- SR & D	1	28-05-2024		TLM2	
67.	Flip flops- JK & T	1	29-05-2024		TLM2	
68.	Registers	1	30-05-2024		TLM1	
69.	Counters	1	30-05-2024		TLM1	
No. of classes required to complete UNIT-V: 16				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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L.B.REDDYNAGAR, MYLAVARAM, NTR DISTRICT, A. P. 521230

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. K. Lakshmi Prasad, Sr. Assistant Professor,
Mrs. B Udaya Lakshmi, Assistat Professor,
Mr. A Shukla, Assistant Professor

Course Name & Code : Engineering Graphics–23ME01
L-T-P Structure :3-0-4 **Credits:**3
Program/Sem/Sec : B.Tech/IISem/ A-Section **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

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

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

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

Textbook:

1. N. D. Bhatt, Engineering Drawing, Charotar Publishing House, 2016.

Reference Books:

1. Engineering Drawing, K.L. Narayana and P. Kannaiah, Tata McGraw Hill, 2013.
2. Engineering Drawing, M.B.Shah and B.C. Rana, Pearson Education Inc,2009.
3. Engineering Drawing with an Introduction to AutoCAD, DhananjayJolhe, Tata McGraw Hill, 2017.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:INTRODUCTION TO ENGINEERING GRAPHICS,LETTERING, SCALES,CURVES, ORTHOGRAPHIC PROJECTIONS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**UNITI:INTRODUCTION:** Introduction to Engineering Graphics, CEOs, COs , PEOs & Pos	1	14..02.24		TLM2	
2.	Engineering Graphics and their significance, Drawing Instruments and their use, **Scales:** Plain scales, diagonal scales and vernier scales.	2	14.02.24		TLM1/ TLM2	
3.	**Curves:** Construction of ellipse, parabola and hyperbola by general method	2	17.02.24		TLM1	
4.	Practice	3	21.02.24		TLM3	
5.	Cycloid, Epicycloid, Hypocycloid, Involutes	2	24.02.24		TLM1	
6.	Practice	3	28.02.24		TLM3	
7.	**Orthographic Projections**: Reference plane, Importance of reference lines or Plane.	2	02.03.24		TLM1	
8.	Practice	3	06.03.24		TLM3	
9.	Projections of a point situated in any oneof the four quadrants.	2	09.03.24		TLM1	
No.ofclassesrequiredtocompleteUNIT-I:20(Lecture:11, Practice: 09)				**No. of classes taken: (including Practice)**		

UNIT-II: PROJECTIONS OF STRAIGHT LINES & PROJECTIONS OF PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13	Introduction to Projections, First and third angle projection methods	1	13.03.24		TLM1	
14.	Projections of straight lines parallel to both reference planes	2	13.03.24		TLM1	
15	Practice	2	16.03.24		TLM3	
16	Projections of straight lines perpendicular to one reference plane and parallel to other reference plane, Projections of straight lines inclined to one reference plane and parallel to the other reference plane	3	20.03.24		TLM1	

19	Practice	2	23.0324		TLM3	
20	**Projections of Planes:** Regular planes Perpendicular to both reference planes	1	27.03.24		TLM1	
21	Practice	2	27.03.24		TLM3	
22	parallel to one reference plane and inclined to the other reference plane;	1	30.03.24		TLM1	
23	Practice	2	30.03.24		TLM3	
No. of classes required to complete UNIT-II:16(Lecture:08 Practice:08)				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topicsto becovered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	**UNITIII: PROJECTIONS OF SOLIDS:** Introduction, Types of solids: Polyhedra and Solids of revolution	1	10.04.24		TLM1	
25.	Projections of solids in simple positions: Axis perpendicular to horizontal plane	2	10.04.24		TLM1	
26.	Practice	2	13.04.24		TLM3	
27.	Axis perpendicular to vertical plane and Axis parallel to both the reference planes	1	20.04.24		TLM1	
28.	Projection of Solids with axis inclined to one reference plane and parallel to another plane	1	20.04.24		TLM1	
29.	Practice	3	24.04.24		TLM3	
30.	Practice	2	27.04.24		TLM3	
No. of classes required to complete UNIT-III:12 (Lecture: 05, Practice: 07)				**No. of classes taken: (including Practice)**		

UNIT-IV: SECTIONS OF SOLIDS & DEVELOPMENT OF SURFACES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
31.	Perpendicular and inclined section planes	1	01.05.24		TLM1	
32.	Practice	2	01.05.24		TLM3	
33.	Sectional views and True shape of section, Sections of solids in simple positions only	2	04.05.24		TLM1	

34.	Practice	3	08.05.24		TLM3	
37.	**Development of Surfaces:** Methods of Development, Parallel line development and radial line development	2	11.05.24		TLM2	
38.	Development of a cube, prism, cylinder, pyramid and cone	1	15.05.24		TLM2	
39.	Practice	2	15.05.24		TLM3	
No. of classes required to complete UNIT-IV:13(Lecture: 06, Practice: 07)				**No. of classes taken:(including Practice)**		

UNIT-V: CONVERSION OF VIEWS & COMPUTER GRAPHICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Introduction to isometric & orthographic views	2	18.05.24		TLM2	
43.	Conversion of isometric views to orthographic views	1	22.05.24		TLM1	
44.	Practice	2	22.05.24		TLM3	
46.	Conversion of orthographic views to isometric views	2	25.05.24		TLM2	
47.	Practice	3	29.05.24		TLM3	
49.	**Computer graphics:** Creating 2D&3D drawings of objects including PCB and Transformations using Auto CAD	2	01.06.24		TLM2	
No. of classes required to complete UNIT-V: 12(Lecture:07, Practice: 05)				**No. of classes taken:**		

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

ACADEMIC CALENDAR:

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

PROGRAMMESPECIFICOUTCOMES (PSOs):

PSO1	To apply the principles of thermal sciences to design and develop various thermal systems.
PSO2	To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.
PSO3	To apply the basic principles of mechanical engineering design for evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. K Lakshmi Prasad, Mrs B Udaya Lakshmi Mr. A Shukla		Dr. M B S S Reddy	Dr. M B S S Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI & ML)

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. SHAIK JAMEER
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /A **A.Y.:** 2023-24

PREREQUISITE: Programming for Problem Solving Using C-20CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	13-02-2024		TLM1	
2.	Definition and Importance of Linear Data Structures	1	15-02-2024		TLM2	
3.	Abstract Data Types and Implementation	1	16-02-2024		TLM1	
4.	Overview of time and space complexity	1	17-02-2024		TLM1	
5.	Analysis of Liner Data structures	2	19-02-2024 20-02-2024		TLM1	
6.	Revise Arrays	1	22-02-2024		TLM1	
7.	Searching Techniques: Linear Search	1	23-02-2024		TLM1	
8.	Binary Search & Analysis	2	24-02-2024 26-02-2024		TLM1	
9.	Bubble Sort & Analysis	1	27-02-2024		TLM1	
10.	Insertion Sort & Analysis	2	29-02-2024 04-03-2024		TLM1	
11.	Selection Sort & Analysis	2	05-03-2024 07-03-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Linked Lists

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	List Implementation using Arrays and Array Disadvantages	1	11-03-2024		TLM1	
13.	Linked List Representation	1	12-03-2024		TLM1	
14.	Single Linked List : Operations	3	14-03-2024 15-03-2024 16-03-2024		TLM1	
15.	Double Linked List : Operations	2	18-03-2024 19-03-2024		TLM1	
16.	Circular Single Linked List	1	21-03-2024		TLM1	
17.	Circular Double Linked List	2	22-03-2024 23-03-2024		TLM1	
18.	Comparing Arrays and Linked List	1	26-03-2024		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	28-03-2024		TLM1	
20.	Polynomial Addition	1	30-03-2024		TLM1	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	08-04-2024		TLM2	

22.	Operations of Stacks	1	12-04-2024		TLM1	
23.	Implementation of stacks using arrays	1	13-04-2024		TLM1	
24.	Stacks using Linked List	1	15-04-2024		TLM1	
25.	Expressions: Expression evaluation	2	16-04-2024 18-04-2024		TLM1	
26.	Infix to Postfix Conversion	2	19-04-2024 20-04-2024		TLM1	
27.	Checking Balanced Parenthesis	2	22-04-2024 23-04-2024		TLM1	
28.	Reversing a List	1	25-04-2024		TLM1	
29.	Backtracking	1	26-04-2024		TLM1	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Queues

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction to queues: properties and operations,	1	27-04-2024		TLM2	
31.	Implementing queues using arrays	1	29-04-2024		TLM1	
32.	Implementing queues using Linked List	1	30-04-2024		TLM1	
33.	Applications of Queue : Scheduling	1	02-05-2024		TLM1	
34.	Breadth First Search	1	03-05-2024		TLM1	
35.	Circular Queue	2	04-05-2024 06-05-2024		TLM1	
36.	Double ended queue	2	07-05-2024 09-05-2024		TLM1	
37.	Applications of Deque	1	10-05-2024		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	11-05-2024		TLM2	
39.	Representation of Trees	1	13-05-2024		TLM1	
40.	Tree Traversals	1	14-05-2024		TLM1	
41.	Binary Search Trees-Operations	3	16-05-2024 17-05-2024 18-05-2024		TLM1	
42.	Hashing Introduction	1	20-05-2024		TLM2	
43.	Hash Functions	1	21-05-2024		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	23-05-2024		TLM1	
45.	Open Addressing: Linear Probing	1	24-05-2024		TLM1	
46.	Quadratic Probing, Double Hashing	1	25-05-2024		TLM1	
47.	Rehashing	1	27-05-2024		TLM1	
48.	Applications of Hashing	1	28-05-2024		TLM1	
49.	Applications of Hashing	1	30-05-2024		TLM1	
No. of classes required to complete UNIT-V: 13				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Evaluation of Prefix Expression	1	18-04-2024					
2.	Towers of Hanoi	1	25-04-2024					
3.	Extendable Hashing	1	31-05-2024					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr. Shaik Jameer**	**Dr. S.Nagarjuna Reddy**	**Dr. Y.V.B Reddy**	**Dr. S.Jayaprada**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:**	B. Tech., I-Sem., AIML-A
ACADEMIC YEAR	**:**	2023-2024
COURSE NAME & CODE	**:**	ENGINEERING PHYSICS LAB & 23FE53
L-T-P STRUCTURE	**:**	0-0-2
COURSE CREDITS	**:**	1
COURSE INSTRUCTOR	**:**	**Dr. S. YUSUB/MRS. P.V. SIRISHA**
COURSE COORDINATOR	**:**	**Dr. S. YUSUB**

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

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

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

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

CO4.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
1 = slight (Low) **2 = Moderate (Medium)** **3 = Substantial (High)**												

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

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

BOS APPROVED TEXT BOOKS:

1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- AIML-A

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Demonstration Experiment 1	3	16-02-2024		**TLM4**	1,2,3,4	T1	
2.	Experiment 2	3	23-02-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
3.	Experiment 3	3	01-03-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
4.	Experiment 4	3	15-03-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
5.	Experiment 5	3	12-04-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
6.	Experiment 6	3	19-04-2024		**TLM4**	CO1, CO2, CO3, CO4	T1	
7.	Experiment 7	3	26-04-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
8.	Demonstration	3	03-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
9.	Experiment 8	3	10-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
10.	Experiment 9	3	17-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
11.	Experiment 10	3	24-05-2024		**TLM4**	CO1, CO2, CO3, CO4, CO5	T1	
12.	Internal	3	31-05-2024		**TLM4**	CO1, CO2,	T1	

	examination					CO3, CO4, CO5		
No. of classes required to complete UNIT-I		36			No. of classes taken:			

EVALUATION PROCESS:

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

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

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

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

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

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

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

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

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. S. YUSUB / Mrs. P.V. Shirisha	Dr. S. YUSUB	Dr. S. YUSUB	Dr A. RAMI REDDY

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A.V. Ravikumar / Mr. P. Rathnakar Kumar/ Mrs. G.Tabita / Mrs. T. Hima Bindu

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

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

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

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

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

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

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

DAY : FRIDAY

Batches : **23761A4201 To 266**

B.NO.	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week
	Tentative date	16/02	23/02	01/03	15/03	22/03	12/04	19/04	26/04	03/05	10/05	17/05	24/05	31/05
	Actual date													
B-1	**23761A4201 TO 23761A4266**	1	2	3,4	5,6	**INTERNAL EXAM-I**	7	8	9	10	11	12	**REVISION OF EXPERIMENTS**	**INTERNAL EXAM-II**
B-2		1	2	3,4	5,6		7	8	9	10	11	12		
B-3		1	2	3,4	5,6		7	8	9	10	11	12		
B-4		1	2	3,4	5,6		7	8	9	10	11	12		
B-5		1	2	3,4	5,6		7	8	9	10	11	12		
B-6		1	2	3,4	5,6		7	8	9	10	11	12		
B-7		1	2	3,4	5,6		7	8	9	10	11	12		
B-8		1	2	3,4	5,6		7	8	9	10	11	12		
B-9		1	2	3,4	5,6		7	8	9	10	11	12		
B-10		1	2	3,4	5,6		7	8	9	10	11	12		

PART-C

EVALUATION PROCESS (R23 Regulations):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Specify, design and analyze systems that efficiently generate, transmit and distribute electrical power
PSO 2	Design and analyze electrical machines, modern drive and lighting systems
PSO 3	Specify, design, implement and test analog and embedded signal processing electronic systems
PSO4	Design controllers for electrical and electronic systems to improve their performance.

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI&ML)

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A.Pratyush / Dr.A.Revanth Reddy

Course Name &	**:** Engineering Workshop & 23ME51	**Regulation**	: R23
L-T-P Structure	**: 0-0-3**	**Credits**	: 1.5
Program/Sem/Sec	**:** B. Tech/I/A/CSE(AIML)	**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

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

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
CO1	3	2	1	1	-	-	-	-	-	-	-	2	3	2
CO2	3	2	1	1	-	-	-	-	-	-	-	2	3	2
CO3	3	2	1	1	-	-	-	-	-	-	-	2	3	2
CO4	3	2	1	1	-	-	-	-	-	-	-	2	3	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
	CYCLE-I					
1.	Introduction to Lab	3	15-02-2024		TLM4	
2.	Dove Tail Joint	3	22-02-2024		TLM4	
3.	Corner Lap Joint	3	29-02-2024		TLM4	
4.	T-Fitting	3	07-03-2024		TLM4	
5.	V-Fitting	3	14-03-2024		TLM4	
6.	Two Laps in Series and Parallel Connection with One Way Switch	3	21-03-2024		TLM4	
7.	Florescent Lamp and Calling Bell Circuit	3	28-03-2024		TLM4	
	CYCLE-II					
8.	Preparation of Pipe Layout	3	18-04-2024		TLM4	
9.	Pipe Threading	3	25-04-2024		TLM4	
10.	Preparation of Rectangular Tray	3	02-05-2024		TLM4	
11.	Preparation of Open Scoop	3	09-05-2024		TLM4	
12.	Preparation Of S-Hook	3	16-05-2024		TLM4	
13.	Preparation of chisel,	3	23-05-2024		TLM4	
14.	Repetition	3	23-05-2024		TLM4	
15.	Internal Lab Exam	3	30-05-2024		-----	
No. of classes required to complete				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To provide students with sound mathematical, engineering, and multidisciplinary knowledge to solve Aerospace and Allied Engineering
PEO 2	To prepare students to excel in higher education programs and to succeed in industry/academia profession.
PEO 3	To inculcate ethical attitude, leadership qualities, problem solving abilities and life-long learning for a successful professional career.

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
PO 3	**Design/development of solutions:** Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems:** Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid
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
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
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.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	To apply the knowledge of Aerodynamics, Propulsion, Aircraft structures, and Flight Dynamics in Aerospace vehicle design.
PSO 2	To prepare the students to work effectively in Aerospace and Allied Engineering organizations.

	Course Instructor	**Module Coordinator**	**Head of the Department**
Signature			
Name of the Faculty	Mr. A.PRATYUSH	Mr. I DAKSHNA MURTHY	Dr. P. LOVARAJU

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. SHAIK JAMEER
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/A **A.Y.:** 2023-24

PREREQUISITE: PPSC

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Array Manipulations	3	13-02-2024		
2.	Searching and Sorting Techniques	3	20-02-2024		
3.	Single Linked List	3	27-02-2024		
4.	Double Linked List	3	05-03-2024		
5.	Circular Linked List	3	12-03-2024		
6.	Polynomial Representation & Polynomial Addition	3	19-03-2024		
7.	Linked List Applications	3	26-03-2024		
8.	Stack Implementation	3	16-04-2024		
9.	Stack Applications	3	23-04-2024		
10.	Queue Implementation & Circular Queue	3	30-04-2024		
11.	Double Ended Queue	3	07-05-2024		
12.	Trees	3	14-05-2024		
13.	Hashing	3	21-05-2024		
14.	Internal Exam	3	28-05-2024		

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mr. Shaik Jameer	Dr. S.Nagarjuna Reddy	Dr. Y.V.B Reddy	**Dr. S.Jayaprada**
Signature				

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

PROGRAM	**: B.Tech., II-Sem., CSM-B**
ACADEMIC YEAR	**: 2023-24**
COURSE NAME & CODE	**: ENGINEERING PHYSICS**
L-T-P STRUCTURE	**: 3-1-0**
COURSE CREDITS	**: 3**
COURSE INSTRUCTOR	**: P VIJAYA SIRISHA**
PRE-REQUISITE	**: Nil**

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

BOS APPROVED REFERENCE BOOKS:

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

WEB REFERENCES AND E-TEXT BOOKS

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: WAVE OPTICS

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	13/02/2024		**TLM2**		
2.	Superposition of Coherence, Conditions for Interference	1	16/02/2024		**TLM1**		
3.	Interference from thin films, colours in thin films	1	17/02/2024		**TLM1**		
4.	Newton's rings	1	20/02/2024		**TLM2**		

5.	Introduction – Diffraction, Types	1	21/02/2024		**TLM1**		
6.	Single slit diffraction	1	23/02/2024		**TLM2**		
7.	Double slit	1	24/02/2024		**TLM4**		
8.	N Slits Diffraction grating	1	27/02/2024		**TLM4**		
9.	TUTORIAL	1	28/02/2024		**TLM3**		
10.	Dispersive power & Resolving power of Grating	1	01/03/2024		**TLM3**		
11.	Polarization introduction Polarization by reflection, refraction	1	02/03/2024		**TLM1**		
12.	Double refraction, Nicol's prism	1	05/03/2024		**TLM1**		
13.	Half wave and quarter wave plate	1	06/03/2024		**TLM2**		
No. of classes required to complete UNIT-I: 13				No. of classes taken:			

UNIT-II: CRYSTALLOGRAPHY AND X RAY DIFFRACTION

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Crystallography Basic defnitions	1	09/03/2024		**TLM2**		
2.	Bravais Lattices	1	19/03/2024		**TLM1**		
3.	Packing fraction of SC, BCC	1	20/03/2024		**TLM1**		
4.	FCC	1	22/03/2024		**TLM2**		
5.	Miller Indices, separation between (hkl) planes	1	23/03/2024		**TLM2**		
6.	Bragg's law	1	26/03/2024		**TLM1**		
7.	X-ray Diffractometer	1	27/03/2024		**TLM2**		
8.	Laue's method powder method	1	30/03/2024		**TLM2**		
9.	Mid 1		02/04/2024				
10.	Mid 1		03/04/2024				
11.	Mid 1		06/04/2024				
No. of classes required to complete UNIT-II: 11				No. of classes taken:			

UNIT-III: DIELECTRIC AND MAGNETIC MATERIALS

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Basic Definitions Relation between electric vectors	1	10/04/2024		**TLM1**		
2.	Electronic polarization	1	12/04/2024		**TLM1**		
3.	Ionic & Orientation polarization	1	13/04/2024		**TLM1**		
4.	Local field,	1	16/04/2024		**TLM1**		
5	Clausius Mosotti equation, complex dielectric constant	1	19/04/2024		**TLM2**		
6	Frequency dependence of polarization Dielectric loss and problems	1	20/04/2024		**TLM1**		
7	Introduction to Magnetic parameters origin of magnetic moment	1	23/04/2024		**TLM1**		
8	Classification of magnetic materials – Dia, para & Ferro	1	24/04/2024		**TLM1**		
9	Classification of magnetic materials – Dia, para & Ferro Anti ferro and ferri	1	26/04/2024		**TLM2**		
10	Domain concept of ferromagnetism and domain walls	1	27/04/2024		**TLM2**		
11	Hysteresis curve soft and hard magnetic materials	1	30/04/2024		**TLM1**		
No. of classes required to complete UNIT-III: 11			No. of classes taken:				

UNIT-IV QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction quantum mechanics, DeBroglie hypothesis	1	01/05/2024		**TLM1**		
2.	Heisenberg uncertainty principle , Physical significance of wave function	1	03/05/2024		**TLM1**		
3.	Schrodinger time dependent & independent wave equations	1	04/05/2024		**TLM1**		
4.	Particle in a box	1	07/05/2024		**TLM1**		
5.	Classical free electron theory-postulates, Success & Failures	1	08/05/2024		**TLM2**		
6.	Quantum free electron theory, electrical conductivity	1	10/05/2024		**TLM1**		
7.	Tutorial	**1**	11/05/2024		**TLM3**		
8.	Fermi-Dirac distribution function-Temperature dependence	**1**	14/05/2024		**TLM2**		
9.	Density of states Fermi energy	**1**	15/05/2024		**TLM2**		
No. of classes required to complete UNIT-IV: 09				No. of classes taken:			

UNIT-V :SEMICONDUCTOR PHYSICS

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction - Classification of semiconductors	1	17/05/2024		**TLM1**		
2.	Density of Intrinsic and semiconductors Electrons, Holes	1	18/05/2024		**TLM1**		
3.	Density of Intrinsic and	1	21/05/2024		**TLM1**		

	semiconductors Holes						
4.	Electrical conductivity and fermi level	1	22/05/2024		**TLM1**		
5.	Density of Extrinsic semiconductors P-Type		24/05/2024		**TLM2**		
6.	Density of Extrinsic semiconductors N Type		25/05/2024		**TLM1**		
7.	Drift and diffusion currents	1	28/05/2024		**TLM2**		
8.	Einstein equation	1	29/05/2024		**TLM1**		
9.	Hall effect and applications	1	01/06/2024		**TLM1**		
10.	Mid - 2		03/06/2024				
No. of classes required to complete UNIT-V: 10				No. of classes taken:			

PART-C

EVALUATION PROCESS (R-20 Regulation):

Evaluation Task	**Marks**
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I, II)	M-1=18
I-Quiz Examination (Units-I, II)	Q1=07
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III , IV & V)	M-2=18
II-Quiz Examination (Units-III, IV & V)	Q2=07
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M-1,M-2)+25% of Min(M-1,M-2)	M=18
Quiz Marks =75% of Max(Q-1,Q-2)+25% of Min(Q-1,Q-2)	Q=07
Cumulative Internal Examination (CIE): A+M+Q	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	**100**

PART-D

PROGRAMME OUTCOMES (POs):

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

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

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., I-Sem., CSM B
ACADEMIC YEAR	**:** 2023-24
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. D. VIJAY KUMAR
COURSE COORDINATOR	**:** Dr.
PRE-REQUISITES	**:** Basics of Vectors**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	13-02-2024		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	14-02-2024		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	15-02-2024		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	16-02-2024		TLM1	CO1	T1,T2	
6.	Exact DE	1	20-02-2024		TLM1	CO1	T1,T2	
7.	Exact DE	1	21-02-2024		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	21-02-2024		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	22-02-2024		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	23-02-2024		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	27-02-2024		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	28-02-2024		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	29-02-2024		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	01-03-2024		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	05-03-2024		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	06-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
18.	Introduction to UNIT II	1	06-03-2024		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	07-03-2024		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	12-03-2024		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	13-03-2024		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	14-03-2024		TLM1	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	15-03-2024		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	19-03-2024		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	20-03-2024		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	21-03-2024		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	22-03-2024		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	26-03-2024 27-03-2024		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	28-03-2024		TLM1	CO1	T1,T2	
32.	TUTORIAL - II	1	27-03-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		14			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	10-04-2024		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	10-04-2024		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	12-04-2024		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	16-04-2024		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	23-04-2024		TLM1	CO2	T1,T2	
41.	TUTORIAL - III	1	24-04-2024		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	30-04-2024		TLM1	CO3	T1,T2	
46.	Directional Derivative	1	01-05-2024		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	07-05-2024		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	08-05-2024		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.	Vector Identities	1	10-05-2024		TLM1	CO3	T1,T2	
55.	TUTORIAL IV	1	14-05-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	15-05-2024		TLM1	CO4	T1,T2	
58.	Line Integral	1	15-05-2024		TLM1	CO4	T1,T2	
59.	Circulation	1	16-05-2024		TLM1	CO4	T1,T2	
60.	Work done	1	17-05-2024		TLM1	CO4	T1,T2	
61.	Surface Integral	1	21-05-2024		TLM1	CO4	T1,T2	
62.	Surface Integral	1	22-05-2024		TLM1	CO4	T1,T2	
63.	Flux	1	22-05-2024		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	23-05-2024		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	24-05-2024		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	1	28-05-2024		TLM1	CO4	T1,T2	
67.	Divergence Theorem	1	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		12			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	1	30-05-2024		TLM2	CO2	T1,T2	
No. of classes		1			No. of classes taken:			

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

Teaching Learning Methods

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

Dr. D. VIJAY KUMAR		**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF ELECTRONICS & COMMUNICATION ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. A. Narendra Babu
Course Name & Code : BASIC ELECTRICAL & ELECTRONICS ENGINEERING – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/I/AI&ML-B **A.Y.:** 2023-24

PREREQUISITE: Physics

COURSE EDUCATIONAL OBJECTIVES (CEOs): To expose to the field of electrical & electronics engineering, laws and principles of electrical/ electronic engineering, and to acquire fundamental knowledge in the relevant field.

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

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

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

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

TEXTBOOKS:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC ELECTRICAL ENGINEERING

UNIT-I: DC & AC Circuits

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to subject and course outcomes	1	13-02-2024		TLM1	
2.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	13-02-2024		TLM1	
3.	**problems**	1	14-02-2024		TLM1	
4.	Ohm's Law and its limitations	1	15-02-2024		TLM1	
5.	KCL & KVL	1	16-02-2024		TLM1	
6.	series, parallel, series-parallel circuits	1	20-02-2024		TLM1	
7.	Super Position theorem	1	20-02-2024		TLM1	
8.	**AC Circuits:** A.C. Fundamentals:	1	21-02-2024		TLM1	
9.	Equation of AC Voltage and current, waveform	1	22-02-2024		TLM1	
10.	time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	23-02-2024		TLM1	
11.	Problems	1	27-02-2024			
12.	form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	27-02-2024		TLM1	
13.	Concept of Impedance, Active power, reactive power and apparent power	1	28-02-2024		TLM1	
14.	problems	1	29-02-2024			
15.	Concept of power factor (Simple Numerical problems).	1	01-03-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Machines and Measuring Instruments

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16.	**Machines:** Construction, principle and operation of DC Motor	1	05-03-2024		TLM1	
17.	Construction, principle and operation of DC Generator	1	05-03-2024		TLM1	
18.	Construction, principle and operation of Three Phase Induction Motor	1	06-03-2024		TLM1	
19.	Construction, principle and operation of Alternator	1	07-03-2024		TLM1	
20.	Applications of electrical machines	1	12-03-2024		TLM1	

21.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	13-03-2024		TLM1	
22.	Moving Iron (MI) Instruments	1	13-03-2024		TLM1	
23.	Wheat Stone bridge.	1	14-03-2024		TLM1	
No. of classes required to complete UNIT-II: 08				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	**Energy Resources:** : Conventional and non-conventional energy resources	1	15-03-2024		TLM1	
25.	Layout and operation of various Power Generation systems: Hydel power generation	1	18-03-2024		TLM1	
26.	Layout and operation of Nuclear power generation	1	18-03-2024		TLM1	
27.	Layout and operation of Solar power generation	1	19-03-2024		TLM1	
28.	Layout and operation of Wind power generation.	1	20-03-2024		TLM1	
29.	**Electricity bill:** : Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc	1	21-03-2024		TLM1	
30.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers	1	22-03-2024		TLM1	
31.	**Equipment Safety Measures:** Working principle of Fuse and Miniature circuit breaker(MCB), merits and demerits	1	26-03-2024		TLM1	
32.	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	26-03-2024		TLM1	
33.	Review	1	27-03-2024		TLM1	
34.	Review	1	28-03-2024		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

PART B: BASIC ELECTRONICS ENGINEERING

UNIT-I: SEMICONDUCTOR DEVICES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
35.	Introduction - Evolution of electronics, Vacuum tubes to nano electronics	1	10-04-2024		TLM1	
36.	Characteristics of PN Junction Diode	1	12-04-2024		TLM1	

37.	Zener Effect — Zener Diode and its Characteristics	1	16-04-2024		TLM1	
38.	Bipolar Junction Transistor	1	16-04-2024		TLM1	
39.	CB Configurations and Characteristics	1	18-04-2024		TLM1	
40.	CE Configurations and Characteristics.	1	19-04-2024		TLM1	
41.	CC Configurations and Characteristics.	1	23-04-2024		TLM1	
42.	Elementary Treatment of Small Signal CE Amplifier.	1	23-04-2024		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-II: BASIC ELECTRONIC CIRCUITS AND INSTRUMENTTAION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Rectifiers and power supplies: Block diagram description of a dc power supply	1	24-04-2024		TLM1	
44.	working of full wave bridge rectifier, capacitor filter (no analysis)	1	25-04-2024		TLM1	
45.	Working of simple zener voltage regulator.	1	26-04-2024		TLM1	
46.	Amplifiers: Block diagram of Public Address system	1	30-04-2024		TLM1	
47.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	30-04-2024		TLM1	
48.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	01-05-2024		TLM1	
49.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	02-05-2024		TLM1	
50.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	03-05-2024		TLM1	
No. of classes required to complete UNIT-V: 08				**No. of classes taken:**		

UNIT-III: DIGITAL ELECTRONICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
51.	Overview of Number Systems	1	07-05-2024		TLM1	
52.	Logic gates including Universal Gates	1	07-05-2024		TLM1	
53.	BCD codes	1	08-12-2023		TLM1	
54.	Excess-3 code, Gray code	1	09-05-2024		TLM1	
55.	Hamming code	1	10-05-2024		TLM1	

56.	Boolean Algebra	1	14-05-2024		TLM1	
57.	Basic Theorems and properties of Boolean Algebra	1	14-05-2024		TLM1	
58.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	15-05-2024		TLM1	
59.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	16-05-2024		TLM1	
60.	Simple combinational circuits	1	17-05-2024		TLM1	
61.	Half and Full Adders	1	21-05-2024		TLM1	
62.	Introduction to sequential circuits	1	21-05-2024		TLM1	
63.	Flip flops	1	22-05-2024		TLM1	
64.	Registers and counters	1	23-05-2024		TLM1	
65.	Revision of Part –A Unit-I	1	24-05-2024		TLM1	
66.	Revision of Unit-II	1	28-05-2024		TLM1	
67.	Revision of Unit-III	1	28-05-2024		TLM1	
68.	Revision of Part-B Unit-1	1	29-05-2024		TLM1	
69.	Revision of Unit-II	1	30-05-2024		TLM1	
70.	Revision of Unit-III	1	31-05-2024		TLM1	
No. of classes required to complete UNIT-V: 20				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	19-09-2023	11-11-2023	8W
I Mid Examinations	6-11-2023	11-11-2023	1W
II Phase of Instructions	13-11-2023	6-1-2024	8W
II Mid Examinations	1-1-2024	6-1-2024	1W
Preparation and Practicals	8-1-2024	20-1-2024	2W
Semester End Examinations	22-1-2024	3-2-2024	2W

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr.A.Narendra Babu**	**Dr.P.Rakesh Kumar**	**Dr.G.Srinivasulu**	**Dr.Y.Amar Babu**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DEPARTMENT OF MECHANICAL ENGINEERING

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

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. P.Vijay Kumar, Professor
Mrs.B.Udaya Lakshmi, Assistant Professor
Mr.S.Umamaheswara Reddy, Assistant Professor

Course Name & Code : Engineering Graphics – 23ME01
L-T-P Structure : 1-0-4 **Credits: 3**
Program/Sem/Sec : B.Tech/II Sem CSM-B Section **A.Y.:** 2023-24
PREREQUISITE : Engineering Physics, Mathematics

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

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

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

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

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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, COs, CEOs, POs and PEOs	1	14-02-2024		TLM2	
2.	Principles of Engineering Graphics and their significance, Drawing Instruments and their use- Conventions in Drawing	1	15-02-2024		TLM2	
3.	Lettering and Dimensioning – BIS conventions	1	15-02-2024		TLM1	
4.	Practice	2	15-02-2024		TLM3	
5.	Geometrical Constructions	1	21-02-2024		TLM1	
6.	Practice	2	22-02-2024		TLM3	
7.	Engineering Curves: Conic Sections- Construction of ellipse	1	22-02-2024		TLM1	
8.	Practice	1	22-02-2024		TLM3	
9.	Construction of Parabola and Hyperbola	1	24-02-2024		TLM1	
10.	Practice	2	24-02-2024		TLM3	
11.	Construction of cycloid	1	28-02-2024		TLM1	
12.	Practice	1	29-02-2024		TLM3	
13.	Epicycloid and hypocycloid, Involutes	1	29-02-2024		TLM1	
14.	Practice	2	29-02-2024		TLM3	
No. of classes required to complete UNIT-I: 19 (Lecture:9 Practice:10)				**No. of classes taken: (including Practice)**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	Introduction to orthographic Projections, Firstand third angle projection methods, Projections of Points	1	06-03-2024		TLM1	
16.	Practice	2	07-03-2024		TLM3	
17.	Projections of straight lines: parallel to both the reference planes	1	07-03-2024		TLM1	

18.	Projections of straight lines: Projections of lines perpendicular to one reference plane and parallel to other reference plane	1	07-03-2024		TLM1	
19.	Practice	2	13-03-2024		TLM3	
20.	Projections of lines when inclined to one reference plane and parallel to other reference plane	1	14-03-2024		TLM1	
21.	Projections of lines when inclined to both the planes	1	14-03-2024		TLM1	
22.	Practice	2	14-03-2024		TLM3	
23	Introduction, planes perpendicular to one plane and parallel to other reference plane.	1	20-03-2024		TLM1	
24	practice	1	21-03-2024		TLM3	
25	planes perpendicular to one plane and inclined to other reference plane.	1	21-03-2024		TLM1	
26	practice	2	21-03-2024		TLM3	
27	Introduction, planes inclined to both the reference planes.	1	27-03-2024		TLM1	
No. of classes required to complete UNIT-II: 22 (Lecture:11 Practice:11)				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
28.	Projection of solids: Introduction, Solids in simple positions	1	28-03-2024		TLM1	
29.	Practice	2	28-03-2024		TLM3	
30.	Projection of solids: Axis perpendicular to horizontal plane & Axis perpendicular to vertical plane	1	28-03-2024		TLM1	
31.	Practice	1	10-04-2024		TLM3	
32.	Projection of solids: Axis parallel to both the reference planes	1	18-04-2024		TLM1	
33.	Practice	1	24-04-2024		TLM3	
34.	Projection of solids: Axis parallel to one reference plane and inclined to other reference plane	1	25-04-2024		TLM1	
35.	Practice	2	25-04-2024		TLM3	
No. of classes required to complete UNIT-III: 10 (Lecture:4 Practice:6)				**No. of classes taken: (including Practice)**		

UNIT-IV: SECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	ActualDate of Completion	Teach ing Learning Methods	HOD Sign Weekly
36	Introduction to section planes and sections of solids & Solids in simple positions	1	25-04-2024		TLM1	
37	practice	1	01-05-2024		TLM3	
38	Perpendicular to one reference plane and parallel to other reference plane	1	02-05-2024		TLM1	
39	practice	2	02-05-2024		TLM3	
40	Inlcined to one reference plane and perpendicular to other plane	1	02-05-2024		TLM1	
41	practice	1	08-05-2024		TLM3	
42	Sectional views of solids and true shapes	1	09-05-2024		TLM1	
43	practice	2	09-05-2024		TLM3	
44	Introduction to Methods of development of surfaces -	1	09-05-2024		TLM1	
45	Parallel line deveolpment	1	15-05-2024		TLM1	
46	practice	2	16-05-2024		TLM3	
47	Radial line development	1	16-05-2024		TLM1	
48	practice	1	16-05-2024		TLM3	
49	Radial line development	1	22-05-2024		TLM3	
50	practice	1	23-05-2024		TLM3	
No. of classes required to complete UNIT-IV: 14 (Lecture:6 Practice:8)				**No. of classes taken: (including Practice)**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
51.	Introduction to Isometric Views	1	23-05-2024		TLM 2	
52.	Practice	2	23-05-2024		TLM 3	
53.	Theory of isometric projection, isometric views, isometric axes, scale, lines & planes	2	29-05-2024		TLM 2	
54.	Practice	1	30-05-2024		TLM 3	
55.	Isometric view of prism, pyramid, cylinder & cone, non-isometric lines-methods to generate an isometric drawing	2	30-05-2024		TLM 1	
56.	Practice	1	30-05-2024		TLM3	

57.	Conversion of Orthographic Projections to Isometric Views of objects	1	30-05-2024		TLM1	
58.	Practice	1	30-05-2024		TLM3	
59.	Conversion of Orthographic Projections to Isometric Views of objects	1	31-05-2024		TLM1	
60.	Practice	2	31-05-2024		TLM 3	
61.	Practice	1	31-05-2024		TLM 3	
62.	Creating 2D and 3D drawings of objects using AutoCAD	1	01-06-2024		TLM 3	
63.	PCB using AutoCAD	1	01-06-2024		TLM 3	
64.	Transformations using AutoCAD	1	01-06-2024		TLM 3	
65.	Revision	1	01-06-2024		TLM 1	
No. of classes required to complete UNIT-V: 19 (Lecture:9 Practice:10)				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of theFaculty	Dr. P.Vijay Kumar	Dr. P.Vijay Kumar	Dr. B.S.Kumar	Dr. M B S S Reddy
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING (AI&ML)

COURSE HANDOUT

PART-A

Name of Course Instructor : JAGADEESWARA RAO P
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : 0-0-3 **Credits:** 1.5
Program/Sem/Sec : B.Tech./II/B-SEC **A.Y.:** 2023-24

PREREQUISITE: C Programming Language

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

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

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

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

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

TEXTBOOKS:

T1. Data Structures and algorithm analysis in C, Mark Allen Weiss, Pearson, 2 nd 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	13-02-2024		TLM1	
2.	Definition and Importance of Linear Data Structures	1	14-02-2024		TLM1	
3.	Abstract Data Types and Implementation	1	15-02-2024		TLM1	
4.	Overview of time and space complexity	1	16-02-2024		TLM1	
5.	Analysis of Liner Data structures	2	17-02-2024 20-02-2024		TLM1	
6.	Revise Arrays	1	21-02-2024		TLM1	
7.	Searching Techniques: Linear Search	1	22-02-2024		TLM1	
8.	Binary Search & Analysis	2	23-02-2024 24-02-2024		TLM1	
9.	Bubble Sort & Analysis	1	27-02-2024		TLM1	
10.	Insertion Sort & Analysis	2	28-02-2024 29-02-2024		TLM1	
11.	Selection Sort & Analysis	2	01-03-2024 02-03-2024		TLM1	
No. of classes required to complete UNIT-I: 15				**No. of classes taken:**		

UNIT-II: Linked Lists

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	List Implementation using Arrays and Array Disadvantages	1	05-03-2024		TLM1	
13.	Linked List Representation	1	06-03-2024		TLM1	
14.	Sing Linked List : Operations	3	07-03-2024 12-03-2024 13-03-2024		TLM1	
15.	Double Linked List : Operations	2	14-03-2024 15-03-2024		TLM1	
16.	Circular Single Linked List	1	16-03-2024		TLM1	
17.	Circular Double Linked List	2	19-03-2024 20-03-2024		TLM1	
18.	Comparing Arrays and Linked List	1	21-03-2024		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	22-03-2024		TLM1	
20.	Polynomial Addition	1	23-03-2024		TLM1	
No. of classes required to complete UNIT-II: 13				**No. of classes taken:**		

UNIT-III: Stacks

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	26-03-2024		TLM1	
22.	Operations of Stacks	1	27-03-2024		TLM1	
23.	Implementation of stacks using arrays	1	28-03-2024		TLM1	
24.	Stacks using Linked List	1	30-03-2024		TLM1	
25.	Expressions: Expression evaluation	2	10-04-2024 12-04-2024		TLM1	
26.	Infix to Postfix Conversion	2	16-04-2024 18-04-2024		TLM1	
27.	Checking Balanced Parenthesis	2	20-04-2024 23-04-2024		TLM1	
28.	Reversing a List	1	24-04-2024		TLM1	
29.	Backtracking	1	25-04-2024		TLM1	
No. of classes required to complete UNIT-III: 12				**No. of classes taken:**		

UNIT-IV: Queues

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction to queues: properties and operations,	1	27-04-2024		TLM1	
31.	Implementing queues using arrays	1	30-04-2024		TLM1	
32.	Implementing queues using Linked List	1	01-05-2024		TLM1	
33.	Applications of Queue : Scheduling	1	02-05-2024		TLM1	
34.	Breadth First Search	1	03-05-2024		TLM1	
35.	Circular Queue	2	04-05-2024 07-05-2024		TLM1	
36.	Double ended queue	2	08-05-2024 09-05-2024		TLM1	
37.	Applications of Deque	1	10-05-2024		TLM1	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	10-05-2024		TLM1	
39.	Representation of Trees	1	11-05-2024		TLM1	
40.	Tree Traversals	1	14-05-2024		TLM1	
41.	Binary Search Trees-Operations	3	15-05-2024 16-05-2024 17-05-2024		TLM1	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
42.	Hashing Introduction	1	18-05-2024		TLM1	
43.	Hash Functions	1	21-05-2024		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	22-05-2024		TLM1	
45.	Open Addressing: Linear Probing	1	23-05-2024		TLM1	
46.	Quadratic Probing, Double Hashing	2	24-05-2024 25-05-2024		TLM1	
47.	Rehashing	2	29-05-2024 30-05-2024		TLM1	
48.	Applications of Hashing	1	31-05-2024		TLM1	
49.	Revision	1	01-06-2024		TLM1	
No. of classes required to complete UNIT-V: 16				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign
1.	Evaluation of Prefix Expression	1	19-04-2024					
2.	Towers of Hanoi	1	26-04-2024					
3.	Extendable Hashing	1	28-05-2024					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-C

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Design and develop sophisticated software systems, leveraging expertise in data structures, algorithm analysis, web design, and proficiency in machine learning and image processing techniques.
PSO 2	Exhibit proficiency in designing and developing networking and embedded software solutions, employing knowledge of data communication, sensor applications, robotics, virtual reality, and Internet of Things (IoT).
PSO 3	Possess the strong data analysis and interpretation skills, enabling them to extract meaningful insights and patterns from large datasets using AI & ML methodologies.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. P Jagadeeswara Rao**	**Dr. S. Nagarjuna Reddy**	**Dr. Y.V.B Reddy**	**Dr. S Jayaprada**
Signature				

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

COURSE HANDOUT

Part-A

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

Course Objectives:

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

Course Outcomes:

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

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

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

CO2.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
1 = slight (Low)		**2 = Moderate (Medium)**					**3 = Substantial (High)**					

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

BOS APPROVED TEXT BOOKS:
1. Lab Manual Prepared by the LBRCE.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section- (CSM) / B

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction	3	12-02-2024		**TLM4**	
2.	Demonstration	3	19-02-2024		**TLM4**	
3.	Experiment 1	3	26-02-2024		**TLM4**	
4.	Experiment 2	3	04-03-2024		**TLM4**	
5.	Experiment 3	3	11-03-2024		**TLM4**	
6.	Experiment 4	3	18-03-2024		**TLM4**	
7.	Experiment 5	3	25-03-2024		**TLM4**	
8.	MID -1	3	01-04-2024		**TLM4**	
9.	Experiment 6	3	08-04-2024		**TLM4**	
10.	Experiment 7	3	15-04-2024		**TLM4**	
11.	Experiment 8	3	22-04-2024		**TLM4**	
12.	Experiment 9	3	29-04-2024		**TLM4**	
13.	Experiment 10	3	06-05-2024		**TLM4**	
14.	Revision	3	13-05-2024		**TLM4**	
15.	**Internal Exam**	3	20-05-2024		**TLM4**	
16.	**Internal Exam**	3	27-05-2024		**TLM4**	
	No. of classes required to complete Syllabus:			48		

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

EVALUATION PROCESS:

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

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

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

PROGRAM OUTCOMES:

Engineering Graduates will be able to:

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

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

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

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

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

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

PROGRAM SPECIFIC OUTCOMES (PSOs):

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

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

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DEPARTMENT OF ELECTRONICS AND COMMUNICATION ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr.A.Narendra Babu,Mr. CH.Mallikharjuna Rao,Mrs.B.Rajeswari, Mr.P.James Vijay

Course Name & Code : Electrical & Electronics Engineering Workshop (Code:ES)

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

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

PREREQUISITE: NIL

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

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): BATCH-I

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Verification of KCL and KVL	3	17-02-2024		TLM4	
2.	Verification of Superposition theorem	3	24-02-2024		TLM4	
3.	Measurement of Resistance using Wheat stone bridge	3	02-03-2024		TLM4	
4.	Magnetization Characteristics of DC shunt Generator	3	09-03-2024		TLM4	
5.	Measurement of Power and Power factor using Single-phase wattmeter	3	16-03-2024		TLM4	
6.	Calculation of Electrical Energy for Domestic Premises	3	23-03-2024		TLM4	
7.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	30-03-2024		TLM4	
8.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.	3	13-04-2024		TLM4	
9.	Implementation of half wave and full wave rectifiers	3	20-04-2024		TLM4	
10.	Plot Input & Output characteristics of BJT in CE and CB configurations	3	27-04-2024		TLM4	
11.	Frequency response of CE amplifier.	3	04-05-2024		TLM4	
12.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	11-05-2024		TLM4	
13.	Make up Lab	3	18-05-2024		TLM4	
14.	Practice if any	3	25-05-2024		TLM4	
15.	Internal Lab Examination	3	01-06-2024		TLM4	
No. of classes required to complete : 45				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr.A.Narendra Babu	Dr. P.Rakesh Kumar		Dr. Y. Amar Babu

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

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

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : S. Rami Reddy, Sr. Asst Professor,
S. Uma maheswara Reddy, Asst Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	LabManual

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

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1	Demonstration	3	19/02/2024		TLM8	R1	
2	Experiment-1	3	26/02/2024		TLM8	R1	
3	Experiment-2	3	04/03/2024		TLM8	R1	
4	Experiment-3	3	11/03/2024		TLM8	R1	
5	Experiment-4	3	18/03/2024		TLM8	R1	
6	Experiment-5	3	08/04/2024		TLM8	61	
I-Mid Examinations (01.04.2024 to 06.04.2024)							
7	Experiment-6	3	15/04/2024		TLM8	R1	
8	Experiment-7	3	22/04/2024		TLM8	R1	
9	Experiment-8	3	29/04/2024		TLM8	R1	
10	Repetition lab	3	06/05/2024		TLM8		
11	Viva voce	3	13/05/2024		TLM6		
12	Viva voce	3	20/05/2024		TLM6		
13	Lab Internal	3	29/05/2024		TLM6		

COURSE DELIVERY PLAN (LESSON PLAN): Section-B (BATCH-B2)

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1	Demonstration	3	19/02/2024		TLM8	R1	
2	Experiment-1	3	26/02/2024		TLM8	R1	
3	Experiment-2	3	04/03/2024		TLM8	R1	
4	Experiment-3	3	11/03/2024		TLM8	R1	
5	Experiment-4	3	18/03/2024		TLM8	R1	
6	Experiment-5	3	08/04/2024		TLM8	61	
I-Mid Examinations (01.04.2024 to 06.04.2024)							
7	Experiment-6	3	15/04/2024		TLM8	R1	
8	Experiment-7	3	22/04/2024		TLM8	R1	

9	Experiment-8	3	29/04/2024		TLM8	R1	
10	Repetition lab	3	06/05/2024		TLM8		
11	Viva voce	3	13/05/2024		TLM6		
12	Viva voce	3	20/05/2024		TLM6		
13	Lab Internal	3	29/05/2024		TLM6		

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	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

Part-C

EVALUATION PROCESS:

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

Details of Batches: B-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B11	23761A4267-274	08	B21	23761A42A0-2A7	08
B12	23761A4275-283	09	B22	23761A42A8-2B6	09
B13	23761A4284-291	08	B23	23761A42B7-2C4	08
B14	23761A4292-299	08	B24	23761A42C5-2D2	08

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

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. P. Jagadeeswara Rao
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE(AI&ML)/II/B **A.Y.:** 2023-24

PREREQUISITE: PPSC

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

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

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

Cos	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PSO 2	PSO 3
CO 1	3	2	2	1	3	-	-	-	-	-	-	-	3	-	-
CO 2	3	2	2	1	3	-	-	-	-	-	-	-	3	-	-
CO 3	3	2	2	1	3	-	-	-	-	-	-	-	3	-	-
CO 4	-	-	-	-	-	-	-	2	2	2	2	2	-	-	-

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Array Manipulations	3	16-02-2024		
2.	Searching and Sorting Techniques	3	23-02-2024		
3.	Single Linked List	3	01-03-2024		
4.	Double Linked List	3	15-03-2024		
5.	Circular Linked List	3	22-03-2024		
6.	Polynomial Representation & Polynomial Addition	3	12-04-2024		
7.	Linked List Applications	3	19-04-2024		
8.	Stack Implementation & Stack Applications	3	26-04-2024		
9.	Queue Implementation & Circular Queue	3	03-05-2024		
10.	Double Ended Queue	3	10-05-2024		
11.	Trees	3	14-05-2024		
12.	Hashing	3	24-05-2024		
13.	Internal Exam	3	31-05-2024		

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Design and develop sophisticated software systems, leveraging expertise in data structures, algorithm analysis, web design, and proficiency in machine learning and image processing techniques.
PSO 2	Exhibit proficiency in designing and developing networking and embedded software solutions, employing knowledge of data communication, sensor applications, robotics, virtual reality, and Internet of Things (IoT).
PSO 3	Possess the strong data analysis and interpretation skills, enabling them to extract meaningful insights and patterns from large datasets using AI & ML methodologies.

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. P Jagadeeswara Rao**	**Dr. S. Nagarjuna Reddy**	**Dr. Y.V.B Reddy**	**Dr. S Jayaprada**
Signature				