FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**: I B. Tech., II-Sem., CSE-A**
ACADEMICYEAR	**: 2025-26**
COURSENAME &CODE	**: ENGINEERING PHYSICS - 23FE04**
L-T-PSTRUCTURE	**: 4-0-0**
COURSECREDITS	**: 3**
COURSEINSTRUCTOR	**: Dr. N. Aruna**
PRE-REQUISITE	**: Basic Knowledge of Physics**

Course Objectives:

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

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

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

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

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

TEXT BOOKS

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

REFERENCES

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

WEBRESOURCES

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

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

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE, DIFFRACTION& POLARIZATION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Introduction to the Subject, Course Outcomes	1	03-02-2026		**TLM-2**		
2	Principle of superposition, Interference of light	1	06-02-2026		**TLM-3**		
3	Interference in thin films by reflection & applications	1	07-02-2026		**TLM-2**		
4	Colors in thin films, Newton's rings	1	07-02-2026		**TLM-1**		
5	Determination of wavelength and refractive index	1	10-02-2026		**TLM-4**		
6	Introduction, Fresnel and Fraunhoffer diffractions	1	13-02-2026		**TLM-1**		

7	Fraunhoffer diffraction due to single slit	1	14-02-2026		**TLM-3**		
8	Double slit& N slits(Qualitative)	1	14-02-2026		**TLM-2**		
9	Tutorial	1	17-02-2026		**TLM-4**		
10	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	20-02-2026		**TLM-3**		
11	Introduction – Types of polarization	1	21-02-2026		**TLM-2**		
12	Polarization by reflection, refraction & double refraction	1	21-02-2026		**TLM-2**		
13	Tutorial	1	24-02-2026		**TLM-2**		
14	Nicol's prism	1	27-02-2026		**TLM-3**		
15	Half wave and Quarter wave plates	1	28-02-2026		**TLM-2**		
No.of classes required to complete UNIT-I:15				No.of classes taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Space lattice; Basis, Unit cell & Lattice parameters	1	28-02-2026		**TLM-2**		
2	Bravais Lattices	1	03-03-2026		**TLM-2**		
3	Crystal Systems(3D)	1	06-03-2026		**TLM-2**		
4	Coordination number – Packing fraction of –SC, BCC	1	07-03-2026		**TLM-1**		
5	Coordination number – Packing fraction of FCC	1	07-03-2026		**TLM-1**		
6	Tutorial	1	10-03-2026		**TLM-3**		
7	Miller indices& Properties Separation between successive (hkl) planes	1	13-03-2026		**TLM-1**		

8	Bragg's law; X–ray Diffractometer	1	14-03-2026		**TLM-2**		
9	Crystal Structure determination by Laue's method	1	14-03-2026		**TLM-2**		
10	Crystal Structure determination by Powder method		17-03-2026				
11	Tutorial	1	20-03-2026		**TLM-3**		
No.of classes required to complete UNIT-II: 11				No.of classes taken:			

UNIT-III :DIELECTRIC & MAGNETIC MATERIALS

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

S.No	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Dielectric polarization Dielectric polarizability, Susceptibility	1	31-03-2026		**TLM-2**		
2	Dielectric constant & Displacement Vector, Relation between the electric vectors	1	04-04-2026		**TLM-3**		
3	Types of polarizations-Electronic polarization	1	04-04-2026		**TLM-1**		
4	Types of polarizations- ionic & orientation polarizations (Qualitative)	1	07-04-2026		**TLM-1**		
5	Lorentz internal field	1	10-04-2026		**TLM-2**		
6	Claussius-Mosotti equation, Complex dielectric constant	1	11-04-2026		**TLM-1**		
7	Frequency dependence of polarization dielectric loss	1	11-04-2026		**TLM-5**		
8	Tutorial	1	17-04-2026		**TLM-3**		
9	Introduction Magnetic dipole moment, Magnetization Magnetic susceptibility & permeability	1	18-04-2026		**TLM-4**		

10	Atomic origin of magnetism	1	18-04-2026		**TLM-1**		
11	Classification of magnetic materials-Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	21-04-2026		**TLM-2**		
12	Tutorial	1	24-04-2026		**TLM-3**		
13	Domain concept for Ferromagnetism & Domain walls	1	25-04-2026		**TLM-5**		
14	Hysteresis loop	1	25-04-2026		**TLM-1**		
15	Soft and hard magnetic materials	1	28-04-2026		**TLM-3**		
No.of classes required to complete UNIT-III: 15				No.of classes taken:			

UNIT-IV :QUANTUM MECHANICS & FREE ELECTRON THEORY

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Dual nature of matter,De-Broglie's Hypothesis	1	01-05-2026		**TLM-3**		
2	Heisenberg's Uncertainty Principle	1	02-05-2026		**TLM-2**		
3	Significance & properties of wave function	1	02-05-2026		**TLM-2**		
4	Schrodinger's time independent and dependent wave equations	1	05-05-2026		**TLM-1**		
5	Tutorial	1	08-05-2026		**TLM-3**		
6	Particle in a one – dimensional infinite potential well	1	09-05-2026		**TLM-3**		
7	Classical free electron theory-merits and demerits, Quantum free electron theory	1	09-05-2026		**TLM-2**		
8	Electrical conductivity based on quantum free electron theory	1	12-05-2026		**TLM-1**		
9	Tutorial	1	15-05-2026		**TLM-5**		
10	Fermi -Dirac distribution and temperature dependence	1	16-06-2026		**TLM-1**		

11	Density of states, Fermi energy	1	16-06-2026		**TLM-3**		
No.of classes required to complete UNIT-IV:11				No.of classes taken:			

UNIT-V: SEMICONDUCTOR PHYSICS

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Formation of energy bands, Classification of crystalline solids	1	02-06-2026		**TLM-6**		
2	Intrinsic semiconductors, Density of charge carriers	1	05-06-2026		**TLM-3**		
3	Extrinsic semiconductors, Density of charge carriers	1	06-06-2026		**TLM-2**		
4	Dependence of Fermi energy on carrier concentration &temperature	1	06-06-2026		**TLM-1**		
5	Drift and Diffusion Currents, Einstein's equation	1	09-06-2026		**TLM-2**		
6	Hall Effect & its applications	1	12-06-2026		**TLM-1**		
7	Tutorial		13-06-2026		**TLM-3**		
8	Assignment		13-06-2026		**TLM-3**		
No.of classes required to complete UNIT-V:08				No.of classes taken:			

PART-C

EVALUATION PROCESS(R-23Regulation)

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=**5**
I-Descriptive Examination (Units-I, II)	M1=**15**
I-Quiz Examination (Units-I, II)	Q1=**10**
Assignment-II (Unit-III, IV & V)	A2=**5**
II- Descriptive Examination (UNIT-III, IV & V)	M2=**15**
II-Quiz Examination (UNIT-III, IV & V)	Q2=**10**

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

PART-D

PROGRAMMEOUTCOMES(POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals,andanengineeringspecializationtothesolutionofcomplex engineeringproblems.
PO 2	**Problem analysis**:Identify,formulate,reviewer search literature,and analyze complexengineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesof 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 needswithappropriateconsiderationforthepublichealthandsafety,and the cultural, societal,and environmental considerations.
PO 4	**Conductivestigations 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 assesssocietal, health,safety,legal and cultural is sues and the consequent responsibilitiesrelevanttotheprofessionalengineeringpractice
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	**Individualandteamwork**:Functioneffectivelyasanindividual,andasamember orleaderindiverseteams,andinmultidisciplinarysettings.
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 amember and lead erina team,to manageprojectsandinmultidisciplinary environments.
PO 12	**Life-long learning**:Recognizetheneedforandhavethepreparationandabilityto engageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. N.Aruna	**Dr.S.Yusub**	**Dr.S.Yusub**	**Dr.T.Satyanarayana**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC with "A" Grade & NBA for ASE, CE, CSE, ECE, EEE, ME & IT (Under Tier - I)
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FRESHMAN ENGINEERING DEPARTMENT

FRESHMAN ENGINEERING DEPARTMENT
COURSE HANDOUT
Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE - A
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K.R. Kavitha
COURSE COORDINATOR	**:** Dr. K. Jhansi Rani
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	03/02/2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	04/02/2026		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	05/02/2026		TLM1	CO1	T1, T2	
4.	Linear Differential equation	1	06/02/2026		TLM1	CO1	T1, T2	
5.	Bernoulli's DE	1	07/02/2026		TLM1	CO1	T1, T2	
6.	Exact DE	1	10/02/2026		TLM1	CO1	T1, T2	
7.	Exact DE	1	11/02/2026		TLM1	CO1	T1, T2	
8.	Non-exact DE Type I	1	12/02/2026		TLM1	CO1	T1, T2	
9.	TUTORIAL - 1	1	13/02/2026		TLM3	CO1	T1, T2	
10.	Non-exact DE Type II	1	17/02/2026		TLM1	CO1	T1, T2	
11.	Non-exact DE Type III	1	18/02/2026		TLM1	CO1	T1, T2	
12.	Non-exact DE Type IV	1	19/02/2026		TLM1	CO1	T1, T2	
13.	Newton's Law of cooling	1	20/02/2026		TLM1	CO1	T1, T2	
14.	Law of natural growth and decay	1	21/02/2026		TLM1	CO1	T1, T2	
15.	Electrical circuits	1	24/02/2026		TLM1	CO1	T1, T2	
16.	TUTORIAL - 2	1	25/02/2026		TLM3	CO1	T1, T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	26/02/2026		TLM1	CO1	T1, T2	
18.	Solving a homogeneous DE	1	27/02/2026		TLM1	CO1	T1, T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	28/02/2026		TLM1	CO1	T1, T2	
20.	P.I for Cos bx, or sin bx	1	03/03/2026		TLM1	CO1	T1, T2	
21.	P.I for polynomial function	1	04/03/2026		TLM1	CO1	T1, T2	
22.	P.I for $e^{ax+b}v(x)$	1	05/03/2026		TLM1	CO1	T1, T2	
23.	P.I for $x^k v(x)$	1	06/03/2026		TLM1	CO1	T1, T2	
24.	TUTORIAL - 3	1	07/03/2026		TLM3	CO1	T1, T2	
25.	Method of Variation of parameters	1	10/03/2026		TLM1	CO1	T1, T2	

26.	Method of Variation of parameters	1	11/03/2026		TLM1	CO1	T1, T2	
27.	Simultaneous linear equations	1	12/03/2026		TLM1	CO1	T1, T2	
28.	L-C-R circuits	1	13/03/2026		TLM1	CO1	T1, T2	
29.	Simple Harmonic motion	1	17/03/2026		TLM1	CO1	T1, T2	
30.	TUTORIAL - 4	1	18/03/2026		TLM3	CO1	T1, T2	
31.	Revision	1	20/03/2026					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	Introduction to Unit III	1	31/03/2026		TLM1	CO2	T1, T2	
33.	Formation of PDE by elimination of arbitrary constants	1	01/04/2026		TLM1	CO2	T1, T2	
34.	Formation of PDE by elimination of arbitrary functions	1	02/04/2026		TLM1	CO2	T1, T2	
35.	Formation of PDE by elimination of arbitrary functions	1	04/04/2026		TLM1	CO2	T1, T2	
36.	Solving of PDE	1	07/04/2026		TLM1	CO2	T1, T2	
37.	Lagrange's Method	1	08/04/2026		TLM1	CO2	T1, T2	
38.	Homogeneous Linear PDE with constant coefficients	1	09/04/2026		TLM1	CO2	T1, T2	
39.	TUTORIAL - 5	1	10/04/2026		TLM3	CO2	T1, T2	
40.	Homogeneous Linear PDE with constant coefficients	1	15/04/2026		TLM1	CO2	T1, T2	
41.	Homogeneous Linear PDE with constant coefficients	1	16/04/2026		TLM1	CO2	T1, T2	
42.	TUTORIAL - 6	1	18/04/2026		TLM3	CO2	T1, T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	Introduction to UNIT IV	1	17/04/2026		TLM1	CO3	T1, T2	
44.	Vector Differentiation	1	21/04/2026		TLM1	CO3	T1, T2	
45.	Gradient	1	22/04/2026		TLM1	CO3	T1, T2	
46.	Directional Derivative	1	23/04/2026		TLM1	CO3	T1, T2	
47.	Divergence	1	24/04/2026		TLM1	CO3	T1, T2	
48.	TUTORIAL - 7	1	25/04/2026		TLM3	CO3	T1, T2	

49.	Curl	1	28/04/2026		TLM1	CO3	T1, T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	29/04/2026		TLM1	CO3	T1, T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	30/04/2026		TLM1	CO3	T1, T2	
52.	Laplacian, second order operators	1	01/05/2026		TLM1	CO3	T1, T2	
53.	TUTORIAL - 8	1	02/05/2026		TLM3	CO3	T1, T2	
54.	Vector Identities	1	05/05/2026		TLM1	CO3	T1, T2	
55.	Vector Identities	1	06/05/2026		TLM1	CO3	T1, T2	
56.	TUTORIAL - 9	1	08/05/2026		TLM3	CO3	T1, T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	07/05/2026		TLM1	CO4	T1, T2	
59.	Line Integral	1	12/05/2026		TLM1	CO4	T1, T2	
60.	Circulation	1	13/05/2026		TLM1	CO4	T1, T2	
61.	Work done	1	14/05/2026		TLM1	CO4	T1, T2	
62.	Surface Integral, Flux	1	15/05/2026		TLM1	CO4	T1, T2	
63.	TUTORIAL - 10	1	16/05/2026		TLM3	CO4	T1, T2	
64.	Volume Integral	1	02/06/2026		TLM1	CO4	T1, T2	
65.	Green's Theorem	1	03/06/2026		TLM1	CO4	T1, T2	
66.	Green's Theorem	1	04/06/2026		TLM1	CO4	T1, T2	
67.	Stoke's Thoerem	1	05/06/2026		TLM1	CO4	T1, T2	
68.	TUTORIAL - 11	1	06/06/2026		TLM3	CO4	T1, T2	
69.	Divergence Theorem	1	09/06/2026		TLM1	CO4	T1, T2	
70.	Divergence Theorem	1	10/06/2026		TLM1	CO4	T1, T2	
71.	Revision	1	11/06/2026					
No. of classes required to complete UNIT-V		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
72.	Non-homogeneous Linear PDE with constant coefficients	1	12/06/2026		TLM2	CO2	T1, T2	
No. of classes		1			No. of classes taken:			

II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)

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

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 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 engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. K.R. KAVITHA	**Dr. K. JHANSI RANI**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

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

Pre-requisites: Physics
Course Educational Objective:

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

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

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

	PART-A
CO1	Extract electrical variables of AC & DC circuits usin fundamental laws. **(Understand)**
CO2	Understand the operation of electrical machines and measuring instruments. **(Understand)**
CO3	Classify various energy resources, safety measures and interpret electricity bill generation in electrical sysems. **(Understand)**
	PART-B
CO4	Interpret the characteristics of various semiconductor devices. **(Understand)**
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	03-02-2026		TLM1	
2.	Ohm's Law and its limitations	1	04-02-2026		TLM1	
3.	KCL & KVL	1	05-02-2026		TLM1	
4.	series, parallel, series-parallel circuits	1	07-02-2026		TLM1	
5.	Super Position theorem	1	10-02-2026		TLM1	
6.	Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	11-02-2026		TLM2	
7.	average value, RMS value, form factor, peak factor	1	12-02-2026		TLM1	
8.	RLC Circuits	1	14-02-2026		TLM1	
9.	Impedance, Power	1	17-02-2026		TLM1	
No. of classes required to complete UNIT-I: 09				**No. of classes taken:**		

UNIT – II: MACHINES AND MEASURING INSTRUMENTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Construction, principle and operation of (i) DC Motor, (ii) DC Generator.	1	18-02-2026		TLM2	
11.	Single Phase Transformer	1	19-02-2026		TLM2	
12.	Three Phase Induction Motor	1	21-02-2026		TLM2	
13.	Alternator	1	24-02-2026		TLM2	
14.	Applications of electrical machines	1	25-02-2026		TLM2	
15.	Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	26-02-2026		TLM2	
16.	Moving Iron (MI) Instruments	1	28-02-2026		TLM2	
17.	Wheat Stone bridge	1	04-03-2026		TLM2	
No. of classes required to complete UNIT-II: 08				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Conventional and non-conventional energy resources, Hydel power generation	1	05-03-2026		TLM2	
19.	Nuclear power plant	1	07-03-2026		TLM2	
20.	Solar & Wind power plants	1	10-03-2026		TLM2	
21.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc.	1	11-03-2026		TLM2	
22.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff,	1	12-03-2026		TLM2	
23.	calculation of electricity bill for domestic consumers.	1	14-03-2026		TLM2	
24.	Working principle of Fuse and Miniature circuit breaker (MCB),	1	17-03-2026		TLM2	

	merits and demerits.					
25.	Personal safety measures: Electric Shock, Earthing and its types, Safety Precautions to avoid shock	1	18-03-2026		TLM2	
No. of classes required to complete UNIT-III: 08				**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
26.	Introduction	1	31-03-2026		TLM1	
27.	Evolution of electronics – Vacuum tubes to nano electronics	1	01-04-2026		TLM2	
28.	PN Junction diode	1	02-04-2026		TLM2	
29.	Characteristics of PN Junction Diode	1	04-04-2026		TLM2	
30.	Zener Effect —	1	07-04-2026		TLM2	
31.	Zener Diode and its Characteristics	1	08-04-2026		TLM2	
32.	Bipolar Junction Transistor	1	09-04-2026		TLM2	
33.	CB Configuration	1	11-04-2026		TLM2	
34.	CE Configuration	1	15-04-2026		TLM2	
35.	CC Configuration	1	16-04-2026		TLM2	
36.	Elementary Treatment of Small Signal CE Amplifier.	1	18-04-2026		TLM2	
37.	Revision	1	21-04-2026		TLM2	
No. of classes required to complete UNIT-IV: 12				**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
38.	Introduction	1	22-04-2026		TLM1	
39.	Block diagram description of a dc power supply.	1	23-04-2026		TLM1	
40.	working of a full wave bridge rectifier	1	25-04-2026		TLM1	
41.	capacitor filter	1	28-04-2026		TLM1	
42.	working of simple zener voltage regulator	1	29-04-2026		TLM1	
43.	Block diagram of Public Address system	1	30-04-2026		TLM1	
44.	Circuit diagram and working of common emitter (RC coupled) amplifier	1	02-05-2026		TLM1	
45.	Frequency response.	1	05-05-2026		TLM1	
46.	Electronic Instrumentation	1	06-05-2026		TLM1	
47.	Block diagram of an electronic instrumentation system	1	07-05-2026		TLM1	
48.	Revision	1	09-05-2026		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

UNIT – VI: DIGITAL ELECTRONICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
49	Overview of Number Systems	1	12-05-2026		TLM2	
50	Conversion of Number system	1	13-05-2026		TLM2	
51	Logic gates	1	14-05-2026		TLM1	
52	BCD & XS-3 code	1	16-05-2026		TLM2	
53	Gray and Hamming code	1	02-06-2026		TLM1	
54	Basic theorems	1	03-06-2026		TLM2	
55	Properties of Boolean Algebra	1	04-06-2026		TLM1	
56	Logic diagrams using logic gates only	1	06-06-2026		TLM2	
57	Combinational Vs Sequential circuits, Half adder, Full adder	1	09-06-2026		TLM1	
58	Introduction to sequential circuits Flip flops- SR & D, JK & T	1	10-06-2026		TLM1	
59	Registers, Counters	1	11-06-2026		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
1.	Simulation of Logic Diagrams	1	13-06-2026		TLM1	

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 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 P SRIHARI**	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr P SOBHARANI**
Signature				

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Phone: 08659-222933, Fax: 08659-222931
DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor(s): **Dr. Siva Sankara Babu Chinka (T571), Mr. K. V. Viswanadh (T572), Mr.S. Uma Maheswara Reddy (T840)**

Course Name & Code	**:** Engineering Graphics – 23ME01	**Regulations**	**:** R23
L-T-P Structure	**:** 2 – 0 - 4	**Credits**	**:** 03
Program /Sem /Sec	: B.Tech/ **II SEM CSE - A Section**	**A.Y.**	**:** 2025-26
PREREQUISITE	**:** Engineering Physics, Engineering 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. (**Understanding Level –L2**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Applying Level –L3**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Apply –L3**)
CO4	Able to draw the development of surfaces of simple objects. (**Applying Level –L3**)
CO5	Prepare isometric and orthographic sections of simple solids. (**Applying Level –L3**)

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

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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

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

UNIT - I: INTRODUCTION, GEOMETRICAL CONSTRUCTIONS, SCALES, CONICS, CYCLOIDS, INVOLUTES, ORTHOGRAPHIC PROJECTIONS OF POINTS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
01	Introduction to Engineering Graphics: COs, CEOs, POs and PEOs **UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, Principles of Engineering Graphics,and their Significance	2	02-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
02	Drawing Instruments and their use-Conventions in Drawing, Lines, Lettering, and Dimensioning – BIS Conventions, Practice	3	03-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
03	**Geometrical Constructions** and Constructing regular polygons by general methods, **Scales**: Plain scales, diagonal scales, and vernier scales	2	09-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
04	Engineering **Curves**: Conic Sections, Construction of Ellipse, Parabola, and Hyperbola by general method only	3	10-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
05	Construction of Cycloids, Involutes, Normal and Tangent to Curves, Practice	2	16-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
06	**Orthographic Projections**: Reference plane, importance of reference lines or Plane, Practice	3	17-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
07	Projections of a point situated in any one of the four quadrants, Practice	2	23-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
08	Projections of a point situated in any one of the four quadrants, Practice	3	24-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
No. of classes required to complete UNIT - I: 20 (Lecture: 08, Practice: 12)			**No. of classes taken (including Practice):**					

UNIT-II: PROJECTIONS OF STRAIGHT LINES AND PLANES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
09	**Projections of straight lines:** Projections of straight lines parallel to both reference planes, perpendicular to one reference plane, and parallel to other reference planes, Practice	2	02-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
10	Projections of lines inclined to one reference plane and parallel to the other reference plane, Practice	3	03-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
11	Projections of Straight Line Inclined to both the reference planes, Practice	2	09-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
12	**Projections of Planes:** Projections of Regular planes Perpendicular to both reference planes, parallel to one reference plane, and inclined to the other reference plane, Practice	3	10-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
13	Projections of planes inclined to both the reference planes, Practice	2	16-03-2026		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
14	Practice	3	17-03-2026		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
-	**I Mid Examinations: From 23-03-2026 to 28-03-2026 (Covered CO 1 & CO 2)**							
No. of classes required to complete UNIT - II: 20 (Lectures: 06, Practice: 09)			**No. of classes taken (including Practice):**					

UNIT-III: PROJECTIONS OF SOLIDS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
15	Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to HP, Practice	2	30-03-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
16	Projections of solids in simple positions: Axis perpendicular to vertical plane and Axis parallel to both the reference planes	3	31-03-2026		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
17	Projection of Solids with axis inclined to one reference plane and parallel to another plane, Practice	2	06-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
18	Numericals	3	07-04-2026		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
19	Practice	2	13-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
20	Practice	3	13-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
No. of classes required to complete UNIT - III: 15 (Lecture: 06, Practice: 09)			**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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
21	Introduction to Sections of Solids and Development of Surfaces: Perpendicular and inclined section planes	2	20-04-2026		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
22	Sectional views and True shape of section, Practice	3	21-04-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
23	Sections of solids in simple position only, Numericals	2	27-04-2026		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
24	**Development of Surfaces:** Introduction to Methods of Development of Surfaces, Parallel Line Development (Plane Surfaces), Practice	3	28-04-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
25	Radial Line Development, Numericals	2	04-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
26	Practice	3	05-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
No. of classes required to complete UNIT - IV: 20 (Lecture: 06, Practice: 09)			**No. of classes taken (including Practice):**					

UNIT-V: CONVERSION VIEWS & COMPUTER GRAPHICS:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
27	Introduction to Isometric Views, Isometric Views of Planes, Solids	2	11-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
28	Conversion of isometric views to orthographic views , Practice	3	12-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
29	Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views	2	01-06-2026		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
30	Practice	3	02-06-2026		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
31	**Computer Graphics**: Creating 2D&3D drawings of objects, including PCB and Transformations using Auto CAD	2	08-06-2026		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
32	Practice	3	09-06-2026		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
No. of classes required to complete UNIT - V: 10 (Lecture: 06, Practice: 09)			**No. of classes taken (including Practice):**					
Summer Vacation: 18-05-20026 to 30-05-2026; II Mid Examinations: From 15-06-20026 to 20-06-2026 (Covered CO 3, CO 4 & CO 5)								

Teaching Learning Methods:

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

PART-C

EVALUATION PROCESS for EG Course (R23 Regulation):

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

ACADEMIC CALENDAR - B.Tech - II Semester (R23):

Commencement of Class work		**02-02-2026**	
Description	**From**	**To**	**Weeks**
I Phase of Instructions	02-02-2026	21-03-2026	7 Weeks
I Mid Examinations	23-03-2026	28-03-2026	1 Week
II Phase of Instructions	30-03-2026	16-05-2026	7 Weeks
Summer Vacation	18-05-2026	30-05-2026	2 Weeks
II Phase of Instructions (Contd..)	01-06-2026	13-06-2026	2 Weeks
II Mid Examinations	15-06-2026	20-06-2026	1 Week
Preparation and Practicals	22-06-2026	27-06-2026	1 Week
Semester End Examinations	29-06-2026	11-07-2026	2 Weeks
Commencement of Next (III) Semester Class Work		**13-07-2026**	

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

↓Day / Date→	**09.00 – 10.00**	**10.00 – 11.00**	**11.00 – 12.00**	**12.00 – 13.00**	**13.00 – 14.00**	**14.00 – 15.00**	**15.00 – 16.00**
Monday		**Engineering Graphics (CSE – A)**		**LUNCH BREAK**			
Tuesday					**Engineering Graphics (CSE – A)**		
Wednesday							
Thursday							
Friday							
Saturday							

Day – to – Day work / Submission of Sheets

S.No	Unit No	Course Outcome	Sheet No. and Content
1	**I**	**CO 1**	1. Geometrical Constructions, Engineering Curves: Ellipse, Parabola, Hyperbola 2. Construction of Cycloids, involutes 3. Projections of Points
2	**II**	**CO 2**	4. Projections of straight lines 5. Projections of Planes
3	**III**	**CO 3**	6. Projections of Solids
4	**IV**	**CO 4**	7. Sections of Solids 8. Development of Surfaces
5	**V**	**CO 5**	9. Isometric views of simple solids, conversion of Isometric views to Orthographic Projections 10. Conversion of Orthographic Projections to Isometric Views

PART-D

Program Educational Objectives (PEOs):

PEO1: Pursue higher education, entrepreneurship and research to compete at global level.

PEO2: Design and develop products innovatively in the area of computer science and engineering and in other allied fields.

PEO3: Function effectively as individuals and as members of a team in the conduct of interdisciplinary projects; and even at all the levels with ethics and necessary attitude.

PEO4: Serve ever-changing needs of the society with a pragmatic perception.

Program Outcomes (POs):

PO1 - Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - Design / Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 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 Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project Management and Finance: Demonstrate knowledge and understanding of the ring 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.

Program Specific Outcomes (PSOs):

PSO1: The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

PSO2: The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

PSO3: To inculcate an ability to analyze, design and implement database applications.

Signature				
Name of the Faculty	Dr.CH. Siva Sankara Babu	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. S. Nagarjuna Reddy
Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SRINIVASARAO
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /A sec. **A.Y.:** 2025-26

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	02-02-2026		TLM1	
2.	Definition and Importance of Linear Data Structures	1	05-02-2026		TLM1 TLM3	
3.	Abstract Data Types and Implementation	1	06-02-2026		TLM1	
4.	Overview of time and space complexity	1	07-02-2026		TLM1	
5.	Analysis of Liner Data structures	2	09-02-2026 12-02-2026		TLM1 TLM3	
6.	Revise Arrays	1	13-02-2026		TLM1	
7.	Searching Techniques: Linear Search	1	14-02-2026		TLM1	
8.	Binary Search & Analysis	1	16-02-2026		TLM1	
9.	Bubble Sort & Analysis	1	19-02-2026		TLM1 TLM3	
10.	Insertion Sort & Analysis	2	20-02-2026 21-02-2026		TLM1	
11.	Selection Sort & Analysis	2	23-02-2026 26-02-2026		TLM1 TLM3	
No. of classes required to complete UNIT-I: 14				**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	27-02-2026		TLM1	
13.	Linked List Representation	1	28-02-2026		TLM1	
14.	Sing Linked List: Operations	2	02-03-2026 05-03-2026		TLM1 TLM3	
15.	Double Linked List: Operations	2	06-03-2026 07-03-2026		TLM1	
16.	Circular Single Linked List	1	09-03-2026		TLM1	
17.	Circular Double Linked List	2	12-03-2026 13-03-2026		TLM1 TLM3	
18.	Comparing Arrays and Linked List	1	14-03-2026		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	16-03-2026		TLM1	
20.	Polynomial Addition	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks: Properties	1	30-03-2026		TLM1	
22.	Operations of Stacks	1	02-04-2026		TLM1 TLM3	
23.	Implementation of stacks using arrays	1	04-04-2026		TLM1	
24.	Stacks using Linked List	1	06-04-2026		TLM1	
25.	Expressions: Expression evaluation	2	09-04-2026 10-04-2026		TLM1 TLM3	
26.	Infix to Postfix Conversion	2	11-04-2026 13-04-2026		TLM1	
27.	Checking Balanced Parenthesis	2	16-04-2026 16-04-2026		TLM1 TLM3	
28.	Reversing a List	1	17-04-2026		TLM1	
29.	Backtracking	1	18-04-2026		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	20-04-2026		TLM1	
31.	Implementing queues using arrays	1	23-04-2026		TLM1 TLM3	
32.	Implementing queues using Linked List	1	24-04-2026		TLM1	
33.	Applications of Queue: Scheduling	2	25-04-2026 27-04-2026		TLM1	
34.	Breadth First Search	1	30-04-2026		TLM1 TLM3	
35.	Circular Queue	2	01-05-2026 02-05-2026		TLM1	
36.	Double ended queue	1	04-05-2026		TLM1	
37.	Applications of Deque	1	07-05-2026		TLM1 TLM3	
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	08-05-2026		TLM1	
39.	Representation of Trees	1	09-05-2026		TLM1	
40.	Tree Traversals	1	11-05-2026		TLM1	
41.	Binary Search Trees- Operations	2	14-05-2026 15-05-2026		TLM1 TLM3	
42.	Hashing Introduction	1	16-05-2026		TLM1	
43.	Hash Functions	1	01-06-2026		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	04-06-2026		TLM1 TLM3	
45.	Open Addressing: Linear Probing	1	05-06-2026		TLM1	
46.	Quadratic Probing, Double Hashing	1	06-06-2026 08-06-2026		TLM1	
47.	Rehashing, Applications of Hashing	1	11-06-2026		TLM1 TLM3	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	2	12-06-2026 13-06-2026					
No. of classes		02			No. of classes taken:			
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)								

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	:	**B. Tech., II-Sem., CSE-A**
ACADEMICYEAR	:	**2025-26**
COURSENAME &CODE	:	**ENGINEERING PHYSICS LAB - 23FE53**
L-T-PSTRUCTURE	:	**0 – 0 – 3**
COURSECREDITS	:	**1**
COURSEINSTRUCTOR	:	**Dr. N. Aruna & Mrs. P.V. Sirisha**
COURSECOORDINATOR	:	**Dr. S. Yusuf**
Pre-requisites	:	**Nil**

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

Course Outcomes:

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

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

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

List of Experiments

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

References:

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

BOSAPPROVEDTEXTBOOKS:

1. Lab Manual Prepared by the LBRCE.

EVALUATIONPROCESS:

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

Part B

Course Delivery Plan (Lesson Plan):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	TeachingLearningMethods	Learning OutcomeCOs	Text Book followed	HOD Sign
1.	Introduction to CO's	3	06-02-2026		TLM-4	CO1,CO2,CO3,CO4 & CO5	T1	
2.	Demonstration	3	13-02-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
3.	Experiment 1	3	20-02-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
4.	Experiment 2	3	27-02-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
5.	Experiment 3	3	06-03-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
6.	Experiment 4	3	13-03-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
7.	Experiment 5	3	20-03-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
8.	Repetition lab	3	10-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
10.	Experiment 6	3	17-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
11.	Experiment 7	3	24-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
12.	Experiment 8	3	01-05-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
13.	Experiment 9	3	08-05-2026		TLM-4	CO1,CO2,CO3,CO4 & CO5	T1	
15	Experiment 10	3	15-05-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
16	Internal Exam	3	05-06-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
17	Internal Exam	3	12-06-2026		TLM-3	CO1,CO2,CO3,CO4& CO5	T1	

PROGRAM OUT COMES: Engineering Graduates will be able to:

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

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

and engineering sciences.

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

4 **Conduct investigations 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 assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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

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

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

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

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

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

Course Instructor	Course- coordinator	Module Coordinator	HOD
13. Dr. N. Aruna & Mrs.P.V.Sirisha	Dr.S.Yusub	Dr. S. Yusub	Dr.T. Satyanarayana

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ELECTRICAL & ELECTRONICS ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr P Srihari / Mrs G Tabita / Dr. M S Giridhar / Dr M Umavani

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

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

Program/Branch/Sem/Sec: B.Tech/CSE/II/A **A.Y.:** 2025-26

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

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

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

CO-PO MATRIX:

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO 11	PO 12	PSO1	PSO2	PSO3	PSO4
CO1	3	2						2	3	2		1				
CO2	2	2		2				2	2	2						
CO3	2	2	2	2				2	2	2				2		
CO4	2	2		3				2	3	2		1	2			
CO5	3	2			2			2	2	2	1	1	2	2	3	2
CO6	3	3		2	2			2	3	3		1			3	

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

DAY : WEDNESDAY
Batches : **ALL STUDENTS**

B.N	H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV	XV	XVI
	Tentative date	04/02	11/02	18/02	25/02	04/03	11/03	18/03	01/04	08/04	15/04	22/04	29/04	06/05	13/05	03/06	10/03
	Actual date																
B	**ALL STUDENTS**	1	2	3	4	5	6	INTERNAL EXAM-I	7	8	9	10	11	12	REVISION OF EXPERIMENTS	REVISION OF EXPERIMENTS	INTERNAL EXAM-II
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		1	2	3	4	5	6		7	8	9	10	11	12			
B		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	Dr P Srihari / Mrs G Tabita / Dr. M S Giridhar / Dr M Umavani	**Dr. A.V.G.A.MARTHANDA**	**Dr.G.NAGESWARA RAO**	**Dr.P SOBHARANI**
Signature				

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

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

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

ACADEMICYEAR : 2025-26

COURSENAME&CODE : Engineering Workshop, 20ME51

L-T-PSTRUCTURE : 0-0-3

COURSECREDITS : 1.5

COURSEINSTRUCTOR : Dr.P.Vijaya Kumar, Professor,
Dr.LPrabhu, Assoc. Professor

COURSECOORDINATOR: Mr.Seelam Srinivasa Reddy, Assoc. Professor

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

COURSEOBJECTIVE: 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, Dovetail joint.
CO2	FabricateandmodelvariousbasicprototypesinthetradeoffittingsuchasStraightfit,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.

COURSEARTICULATIONMATRIX(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: EnterCorrelationLevels**1**or**2**or**3**.Ifthereisnocorrelation,**put"1**Slight (Low),**2-**Moderate (Medium),**3-**Substantial (High).

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN(LESSON PLAN):(BATCH-A1)

S.No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	02-02-2026		TLM8	-	
2.	Experiment-1	3	09-02-2026		TLM8	R1	
3.	Experiment-2	3	16-02-2026		TLM8	R1	
4.	Experiment-3	3	23-02-2026		TLM8	R1	
5.	Experiment-4	3	02-03-2026		TLM8	R1	
6.	Experiment-5	3	09-03-2026		TLM8	R1	
I-Mid Examinations (23-03-2026 to 28-03-2026)							
7.	Experiment-6	3	16-03-2026		TLM8	61	
8.	Experiment-7	3	30-03-2026		TLM8	R1	
9.	Experiment-8	3	06-04-2026		TLM8	R1	
10.	Experiment-9	3	13-04-2026		TLM8	R1	
11.	Experiment-10	3	20-04-2026		TLM8	R1	
12.	Repetition lab	3	27-04-2026		TLM8	--	
13.	Lab Internal	3	04-05-2026		TLM6	--	

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

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	02-02-2026		TLM8	-	
2.	Experiment-1	3	09-02-2026		TLM8	R1	
3.	Experiment-2	3	16-02-2026		TLM8	R1	
4.	Experiment-3	3	23-02-2026		TLM8	R1	
5.	Experiment-4	3	02-03-2026		TLM8	R1	
6.	Experiment-5	3	09-03-2026		TLM8	R1	
I-Mid Examinations (23-03-2026 to 28-03-2026)							
7.	Experiment-6	3	16-03-2026		TLM8	R1	
8.	Experiment-7	3	30-03-2026		TLM8	61	
9.	Experiment-8	3	06-04-2026		TLM8	R1	
10.	Experiment-9	3	13-04-2026		TLM8	R1	
11.	Experiment-10	3	20-04-2026		TLM8	R1	
12.	Repetition lab	3	27-04-2026		TLM8	R1	
13.	Lab Internal	3	04-05-2026		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	02-02-2026	21-03-2026	7 Weeks
I Mid Examinations	23-03-2026	28-03-2026	1 Week
II Phase of Instructions	30-03-2026	16-05-2026	7 Weeks
Summer Vacation	18-05-2026	30-05-2026	2 Weeks

II Phase of Instructions (Contd..)	01-06-2026	13-06-2026	2 Weeks
II Mid Examinations	15-06-2026	20-06-2026	1 Week
Preparation and Practicals	22-06-2026	27-06-2026	1 Week
Semester End Examinations	29-06-2026	11-07-2026	2 Weeks

Part-C

EVALUATIONPROCESS:

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
TotalMarks:A1+B1+C1+D1	100Marks

Details of Batches: A-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
A11	25761A0501-0508	8	A21	25761A0533-0540	8
A12	25761A0509-0516	8	A22	25761A0541-0548	8
A13	25761A0517-0524	8	A23	25761A0549-0556	8
A14	25761A0525-0532	8	A24	25761A0557-0564 and 24761A0537	9

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09
A11	F1	F2	P1	P2	C1	C2	E1	E2	T1
A12	F2	F1	P2	P1	C2	C1	E2	E1	T1
A13	P1	P2	C1	C2	E1	E2	F1	F2	T1
A14	P2	P1	C2	C1	E2	E1	F2	F1	T1
A21	C1	C2	E1	E2	F1	F2	P1	P2	T1
A22	C2	C1	E2	E1	F2	F1	P2	P1	T1
A23	E1	E2	F1	F2	P1	P2	C1	C2	T1
A24	E2	E1	F2	F1	P2	P1	C2	C1	T1

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dove Tail Joint	CO1
3.	Fitting-1(F1)-L-**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

9.	Tinsmity-1(T1)- Rectangular Tray	CO2
10.	Demonstration- Welding and Foundry	CO2

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

member or leader in diverse teams, and in multi-disciplinary settings.

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Dr.P.Vijaya Kumar **Dr.L.Prabhu**	**Mr. Seelam.Srinivasa Reddy**	**Mr. J.Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. N. SRINIVASARAO
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/A sec. **A.Y.:** 2025-26

PREREQUISITE: Introduction to Programming, Computer Programming Lab

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Delivery Method	HOD Sign
1.	Introduction & COs Discussion	3	05-02-2026		TLM4	
2.	Array Manipulations	3	12-02-2026		TLM4	
3.	Searching and Sorting Techniques	3	19-02-2026		TLM4	
4.	Single Linked List	3	26-02-2026		TLM4	
5.	Double Linked List	3	05-03-2026		TLM4	
6.	Circular Linked List	3	12-03-2026		TLM4	
7.	Polynomial Representation & Polynomial Addition	3	02-04-2026		TLM4	
8.	Linked List Applications	3	09-04-2026		TLM4	
9.	Stack Implementation	3	16-04-2026		TLM4	
10.	Stack Applications	3	23-04-2026		TLM4	
11.	Queue Implementation & Circular Queue	3	30-04-2026		TLM4	
12.	Double Ended Queue	3	07-05-2026		TLM4	
13.	Trees	3	14-05-2026		TLM4	
14.	Hashing	3	04-06-2026		TLM4	
15.	Internal Exam	3	11-06-2026		TLM4	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
PART-A

Course Instructor	**:** P. Vijaya Sirisha	
Course Name & Code	**:** Engineering Physics & 23FE04	**Credits:** 3
L-T-P Structure	**: 3-1-0**	**A.Y.:** 2025-26
Program/Sem./Branch	: B.Tech/I/CSE C	**Regulations**: R23

Pre-requisite **:** Basic Knowledge of Physics

Course Objectives:

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

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

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

Course Articulation Matrix (Correlation between COs, Pos & PSOs):

Course Designed by				Division of Physics, Freshman Engineering Department								
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
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)				

Textbooks

1. Engineering Physics, M.N.Avadhanulu, P.G.Kshirsagar, T.V.S. Arun Murthy, *S.Chand &Co., 11th Ed.*, 2019.
2. Engineering Physics, D.K. Bhattacharya & Poonam Tandon, *Oxford Press*, 2015.

References

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

Web Resources

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

PART-B

Course Delivery Plan (Lesson Plan): ASE

Unit-I: Interference, Diffraction & Polarization **Course Outcome:** CO1; **Textbook:** T1, R2

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course & its Outcomes	1	02-02-2026		TLM-2	
2.	**Interference**: Introduction, Principle of Superposition, Interference of light	1	03-02-2026		TLM-1	
3.	Interference in thin films by Reflection & Applications	1	04-02-2026		TLM-1	
4.	Colors in thin films, Newton's rings	1	07-02-2026		TLM-1	
5.	Determination of wavelength and refractive index	1	09-02-2026		TLM-1	
6.	**Diffraction**: Introduction, Fresnel and Fraunhoffer diffractions	1	10-02-2026		TLM-1	
7.	Problems & Assignment/Tutorial	1	11-02-2026		TLM-3	
8.	Fraunhoffer diffraction due to single slit	1	14-02-2026		TLM-2	
9.	Double slit & N slits (Qualitative)	1	16-02-2026		TLM-2	
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	17-02-2026		TLM-1	
11.	Tutorial	1	18-02-2026		TLM-3	
12.	**Polarization**: Introduction – Types of polarization	1	21-02-2026		TLM-2	
13.	Polarization by reflection, refraction & double refraction	1	23-02-2026		TLM-2	
14.	Nicol's Prism	1	24-02-2026		TLM-1	
15.	Tutorial	1	25-02-2026		TLM-3	
16.	Half wave and Quarter wave plates	1	28-02-2026		TLM-2	
No. of classes required to complete UNIT-I: 16				**No. of classes taken:**		

Unit-II: Crystallography & X– Ray Diffraction **Course Outcome**: CO2; **Textbook**: T1, R2

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	**Crystallography:** Space lattice; Basis, Unit cell & Lattice parameters	1	02-03-2026		TLM-2	
18.	Crystal Systems (3D)	1	03-03-2026		TLM-2	
19.	Bravais Lattices	1	07-03-2026		TLM-2	
20.	Coordination number and Packing fraction of SC, BCC	1	09-03-2026		TLM-1	
21.	Coordination number and Packing fraction of FCC	1	10-03-2026		TLM-1	
22.	Miller indices-Properties	1	11-03-2026		TLM-1	
23.	Tutorial	1	14-03-2026		TLM-3	
24.	Miller indices-Sketching planes	1	16-03-2026			
25.	Separation between successive (hkl) planes	1	17-03-2026		TLM-2	
26.	**X-ray diffraction:** Bragg's law	1	18-03-2026		TLM-2	
27.	X–ray Diffractometer	1	21-03-2026		TLM-2	
28.	Crystal Structure determination by Laue's method Powder method	1	23-03-2026		TLM 2	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

Unit-III: Dielectric & Magnetic Materials **Course Outcome:** CO3; **Textbook:** T1, R2

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
29.	**Dielectric Materials:** Introduction, Dielectric polarization, Dielectric polarizability, Susceptibility	1	30-03-2026		TLM-2	
30.	Dielectric constant and displacement vector	1	31-03-2026		TLM-2	
31.	Relation between the electric vectors	1	01-04-2026		TLM-1	
32.	Types of polarizations- Electronic polarization (Quantitative)	1	04-04-2026		TLM-1	
33.	Tutorial	1	06-04-2026		TLM-3	
34.	Ionic Polarization (Quantitative) & Orientation polarization (Qualitative)	1	07-04-2026		TLM-2	
35.	Lorentz internal field	1	08-04-2026		TLM-2	
36.	Claussius-Mossotti equation, complex dielectric constant	1	11-04-2026		TLM-1	
37.	Frequency dependence of polarization	1	13-04-2026		TLM-1	
38.	Dielectric loss	1	15-04-2026		TLM-1	
39.	**Magnetic Materials:** Introduction Magnetic dipole moment, Magnetization, Magnetic susceptibility and permeability	1	18-04-2026		TLM-2	
40.	Tutorial	1	20-04-2026		TLM-3	
41.	Atomic origin of magnetism	1	21-04-2026		TLM-1	
42.	Classification of magnetic materials- Dia, Para, Ferro, Anti-Ferro & Ferri magnetic materials	1	22-04-2026		TLM-1	
43.	Domain concept for Ferromagnetism & Domain walls	1	25-04-2026		TLM-1	
44.	Hysteresis, Soft and hard magnetic materials	1	27-04-2026		TLM-1	
No. of classes required to complete UNIT-III: 16				**No. of classes taken:**		

Unit-IV: Quantum Mechanics & Free Electron Theory **Course Outcome:** CO4; **Textbook:** T1, R2

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	**Quantum Mechanics:** Dual nature of matter, De-Broglie's Hypothesis	1	28-04-2026		TLM-2	
46.	Heisenberg's Uncertainty Principle		29-04-2026		TLM-1	
47.	Significance & properties of wave function	1	02-05-2026		TLM-2	
48.	Schrodinger's time independent and dependent wave equations	1	04-05-2026		TLM-1	
49.	Tutorial	1	05-05-2026		TLM-3	
50.	Particle in a one –dimensional infinite potential well	1	06-05-2026		TLM-1	
51.	**Free Electron Theory:** Classical free electron theory (Qualitative with discussion of merits and demerits)	1	09-05-2026		TLM-1	
52.	Quantum free electron theory, Electrical conductivity based on quantum free electron theory	1	11-05-2026		TLM-2	
53.	Tutorial	1	12-05-2026		TLM-3	
54.	Fermi -Dirac distribution and temperature dependence		13-05-2026		TLM-1	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
55.	Density of states, Fermi energy	1	16-05-2026		TLM-1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

Unit-V: Semiconductor Physics **Course Outcome:** CO5; **Textbook:** T2, R1

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
56.	**Semiconductors**: Formation of energy bands, Classification of crystalline solids	1	01-06-2026		TLM-1	
57.	Intrinsic semiconductors, Density of charge carriers	1	02-06-2026		TLM-1	
58.	Electrical conductivity, Fermi level	1	03-06-2026		TLM-2	
59.	Extrinsic semiconductors (p-type) Density of charge carriers	1	06-06-2026		TLM-2	
60.	Extrinsic semiconductors (n-type) Density of charge carriers	1	08-06-2026		TLM-2	
61.	Dependence of Fermi energy on carrier concentration &temperature	1	09-06-2026		TLM-1	
62.	Drift and Diffusion Currents, Einstein's equation	1	10-06-2026		TLM-1	
63.	Hall Effect & its applications	1	13-06-2026		TLM-1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation)

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Date: 11-08-2025

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
P. Vijaya Sirisha	Dr. S. Yusuf	Dr. S. Yusuf	Dr. T. Satyanarayana

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE C
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K. Jhansi Rani
COURSE COORDINATOR	**:** Dr. K. Jhansi Rani
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	02/02/2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	04/02/2026		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	05/02/2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	06/02/2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07/02/2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	09/02/2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	11/02/2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	12/02/2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	13/02/2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	14/02/2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	16/02/2026		TLM1	CO1	T1,T2	
12.	TUTORIAL - 1	1	18/02/2026		TLM3	CO1	T1,T2	
13.	Newton's Law of cooling	1	19/02/2026		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	20/02/2026		TLM1	CO1	T1,T2	
15.	Electrical circuits	1	21/02/2026		TLM1	CO1	T1,T2	
16.	TUTORIAL - 2	1	25/02/2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I		14			No. of classes taken:			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
17.	Introduction to UNIT II	1	23/02/2026		TLM1	CO1	T1,T2	
18.	Solving a homogeneous DE	1	26/02/2026		TLM1	CO1	T1,T2	
19.	Finding Particular Integral, P.I for e^{ax+b}	1	27/02/2026		TLM1	CO1	T1,T2	
20.	P.I for Cos bx, or sin bx	1	28/02/2026		TLM1	CO1	T1,T2	
21.	P.I for polynomial function	1	02/03/2026		TLM1	CO1	T1,T2	
22.	TUTORIAL - 3	1	04/03/2026		TLM3	CO1	T1,T2	

23.	P.I for $e^{ax+b}v(x)$	1	05/03/2026		TLM1	CO1	T1,T2	
24.	P.I for $x^k v(x)$	1	06/03/2026		TLM1	CO1	T1,T2	
25.	Method of Variation of parameters	1	07/03/2026		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	09/03/2026		TLM1	CO1	T1,T2	
27.	TUTORIAL - 4	1	11/03/2026		TLM3	CO1	T1,T2	
28.	Simultaneous linear equations	1	12/03/2026		TLM1	CO1	T1,T2	
29.	L-C-R circuits	1	13/03/2026		TLM1	CO1	T1,T2	
30.	Simple Harmonic motion	1	16/03/2026		TLM1	CO1	T1,T2	
31.	TUTORIAL - 5	1	18/03/2026		TLM3	CO1	T1,T2	
32.	Revision	1	20/03/2026					
No. of classes required to complete UNIT-II		16			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	30/03/2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	01/04/2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	02/04/2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	04/04/2026		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	06/04/2026		TLM1	CO2	T1,T2	
38.	TUTORIAL - 6	1	08/04/2026		TLM3	CO2	T1,T2	
39.	Lagrange's Method	1	09/04/2026		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	10/04/2026		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	13/04/2026		TLM1	CO2	T1,T2	
42.	TUTORIAL - 7	1	15/04/2026		TLM3	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	16/04/2026		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		11			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
44.	Introduction to UNIT IV	1	17/04/2026		TLM1	CO3	T1,T2	
45.	Vector Differentiation	1	18/04/2026		TLM1	CO3	T1,T2	

46.	Gradient	1	20/04/2026		TLM1	CO3	T1,T2	
47.	TUTORIAL - 8	1	22/04/2026		TLM3	CO3	T1,T2	
48.	Directional Derivative	1	23/04/2026		TLM1	CO3	T1,T2	
49.	Divergence	1	24/04/2026		TLM1	CO3	T1,T2	
50.	Curl	1	25/04/2026		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	27/04/2026		TLM1	CO3	T1,T2	
52.	TUTORIAL - 9	1	29/04/2026		TLM3	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	30/04/2026		TLM1	CO3	T1,T2	
54.	Laplacian, second order operators	1	01/05/2026		TLM1	CO3	T1,T2	
55.	Vector Identities	1	02/05/2026		TLM1	CO3	T1,T2	
56.	Vector Identities	1	04/05/2026		TLM1	CO3	T1,T2	
57.	TUTORIAL - 10	1	06/05/2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
58.	Introduction to Unit-V	1	07/05/2026		TLM1	CO4	T1,T2	
59.	Line Integral	1	08/05/2026		TLM1	CO4	T1,T2	
60.	Circulation	1	11/05/2026		TLM1	CO4	T1,T2	
61.	TUTORIAL - 11	1	13/05/2026		TLM3	CO4	T1,T2	
62.	Work done	1	14/05/2026		TLM1	CO4	T1,T2	
63.	Surface Integral, Flux	1	15/05/2026		TLM1	CO4	T1,T2	
64.	Volume Integral	1	16/05/2026		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	01/06/2026		TLM1	CO4	T1,T2	
66.	TUTORIAL - 12	1	03/06/2026		TLM3	CO4	T1,T2	
67.	Green's Theorem	1	04/06/2026		TLM1	CO4	T1,T2	
68.	Stoke's Theorem	1	05/06/2026		TLM1	CO4	T1,T2	
69.	Divergence Theorem	1	06/06/2026		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	08/06/2026		TLM1	CO4	T1,T2	
71.	Revision	1	10/06/2026					
No. of classes required to complete UNIT-V		14			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
72.	Non-homogeneous Linear PDE with constant coefficients	2	11/06/2026 & 12/06/2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			

II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.Nagalinga Chary
Course Name & Code : Basic Electrical & Electronics Engineering – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Branch/Sem/Sec : B.Tech /CSE, C Sec II SEM **A.Y.:** 2025-26
Pre-requisites: Physics

Course Educational Objectives:

- 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. **(Understand)**
	PART-B
CO4	Interpret the characteristics of various semiconductor devices. **(Knowledge)**
CO5	Infer the operation of rectifiers, amplifiers. **(Understand)**
CO6	Contrast various logic gates, sequential and combinational logic circuits. **(Understand)**

CO-PO Articulation Matrix: (Correlation between COs, POs & PSOs):

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	3	3										1	2	1		1
CO2	3											1	2	3		1
CO3	3	2				1	1				1	1	2			
CO4	3	2										1	1		2	2
CO5	3	2										1	2		3	1
CO6	2	2	2									1	2		2	2
1 - Low						**2** –Medium							**3 -** High			

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition
4. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education,
5. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

Reference Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

ELECTRICAL ENGINEERING

UNIT-I: DC & AC CIRCUITS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**DC Circuits:** Introduction:PEOs,PO&PSOs,COs	1	02-02-2026			
2.	Electrical circuit elements	1	03-02-2026		TLM1	
3.	KCL & KVL,Ohm's Law and its limitations	1	05-02-2026		TLM1	
4.	Series, parallel, series-parallel circuits	1	06-02-2026		TLM1	
5.	Super Position theorem	1	09-02-2026		TLM1	
6.	**AC Circuits:** Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	10-02-2026		TLM1	
7.	average value, RMS value, form factor, peak factor	1	12-02-2026		TLM2	
8.	Impedance,Power,Power factor RLC Circuits	2	13-02-2026 16-02-2026		TLM1	
9.	Simple numerical problems	1	17-02-2026		TLM3	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT – II: MACHINES AND MEASURING INSTRUMENTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	**Machines:** Construction, principle and operation of (i) DC Motor	1	19-02-2026		TLM2	
11.	Construction, principle and operation of (ii) DC Generator.	1	20-02-2026		TLM2	
12.	Single Phase Transformer	1	23-02-2026		TLM2	
13.	Three Phase Induction Motor	1	24-02-2026		TLM2	
14.	Alternators, Applications of electrical machines	1	26-02-2026		TLM2	
15.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	27-02-2026		TLM2	
16.	Moving Iron (MI) Instruments & Wheatstone bridge	1	02-03-2026		TLM2	
No. of classes required to complete UNIT-II: 07				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Conventional and non-conventional energy resources, Hydel & Nuclear power generation	1	05-03-2026		TLM2	
18.	Solar & Wind power plants	1	06-03-2026		TLM2	

19.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc	1	09-03-2026		TLM2	
20.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.	2	10-03-2026 12-03-2026		TLM2	
21.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	13-03-2026		TLM2	
22.	Personal safety measures: Electric Shock, Earthing and its types& Safety Precautions	1	16-03-2026		TLM2	
23.	**Beyond the Syllabus**: Thermal Power Plant	1	17-03-2026			
No. of classes required to complete UNIT-III: 8				**No. of classes taken:**		

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

ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction – Course Outcomes	1	30-03-2026		TLM1	
2.	Evolution of electronics, Vacuum tubes to nano electronics	1	31-03-2026		TLM1	
3.	Characteristics of PN Junction Diode	1	02-04-2026		TLM1	
4.	Zener Effect — Zener Diode	1	06-04-2026		TLM1	
5.	Zener Effect — Zener Diode and its Characteristics	2	07-04-2026 09-04-2026		TLM1	
6.	Bipolar Junction Transistor	1	10-04-2026		TLM1	
7	CB Configurations and Characteristics	1	13-04-2026		TLM2	
8.	CE,CC Configurations and Characteristics.	2	16-04-2026 17-04-2026		TLM2	
9	Elementary Treatment of Small Signal CE Amplifier.	2	20-04-2026 21-04-2026		TLM1	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	23-04-2026		TLM1	
11	Working of full wave bridge rectifier, capacitor filter (no analysis)	2	24-04-2026 27-04-2026		TLM1	
12	Working of simple Zener voltage regulator.	1	28-04-2026		TLM1	
13	**Amplifiers**: Block diagram of Public Address system	2	30-04-2026 01-05-2026		TLM2	

14	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	04-05-2026		TLM2	
15	**Electronic Instrumentation:** Block diagram of an electronic instrumentation system.	1	05-05-2026		TLM2	
No. of classes required to complete UNIT-II: 8				**No. of classes taken:**		

UNIT-III: Digital Electronics

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16	Overview of Number Systems	1	07-05-2026		TLM1	
17	Logic gates including Universal Gates	1	08-05-2026		TLM2	
18	BCD codes, Excess-3 code	1	11-05-2026		TLM1	
19	Gray code, Hamming code	1	12-05-2026		TLM1	
20	Boolean Algebra basics	1	14-05-2026		TLM1	
21	Basic Theorems and properties of Boolean Algebra	1	15-05-2026		TLM2	
22	Simple combinational circuits	1	01-06-2026		TLM1	
23	Half and Full Adders	1	02-06-2026		TLM1	
24	Introduction to sequential circuits, Flip flops,	2	04-06-2026 05-06-2026		TLM2	
25	Registers and counters	2	08-06-2026 09-06-2026		TLM2	
26	Review	1	11-06-2026		TLM1	
27	**Beyond the syllabus:** Operational Amplifier	1	12-06-2026		TLM1	
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

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

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
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PO 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.

Mr.K.Nagalinga Chary	Dr. AVGA Marthanda	Dr. G.Nageswara Rao	Dr. P.Sobha Rani
Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**

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

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: **Dr. B. Sudheer Kumar, Sr.Asst.Professor,**
Mr. K. Lakshmi Prasad, Sr. Asst. Professor
Mr. Mallikarjuna Rao, Sr. Asst. Professor,

Course Name & Code	**:** Engineering Drawing – 23ME01	
L-T-P Structure	**:** 3-0-4	**Credits:** 4
Program/Sem/Sec	: B.Tech/I Sem/CSE-C	**A.Y.:** 2025-26

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, students will be able to

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

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

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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

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

R3 Venugopal, Engineering Drawing and Graphics, New Age publishers

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
1	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, CEOs, COs, PEOs, and POs and PSOs	2	02-02-2026		TLM1/ TLM2	
2	Principles of Engineering Graphics and their significance, Drawing Instruments and their use- Conventions in Drawing – Practical orientation					
3	Lettering and Dimensioning – BIS Conventions- Geometrical Constructions – Theory Class					
4	Practice	3	04-02-2026		TLM4	
5	Engineering Curves: Conic Sections- Construction of ellipse, parabola and Hyperbola –Theory class	2	09-02-2026		TLM1	
6	Construction of Parabola, ellipse, hyperbola – General method -Practice	3	11-02-2026		TLM4	
7	Cycloids –Theory class	2	16-02-2026		TLM1	
8	Practice Session	3	18-02-2026		TLM4	
9	Involutes – Theory class	2	23-02-2026		TLM1	
10	Practice Session	3	25-02-2026		TLM4	
No. of classes required to complete UNIT-I: 18 (Lecture: Practice:12)				**No. of classes taken: (including Practice)**		

UNIT-II: PROJECTIONS OF POINTS, LINES AND PLANES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
9	Orthographic Projections, First and third angle projection methods, Projections of Points, Lines inclined to one plane	2	02-03-2026		TLM1	
10	Practice Session	3	04-03-2026		TLM4	
11	Projection of lines - Projections of Straight Line Inclined to both the reference planes	2	09-03-2025		TLM1	
12	Practice Session	3	11-03-2026		TLM4	
13	Projections of planes- Regular planes Perpendicular to both reference planes, parallel to one reference plane and inclined to the other reference plane; plane inclined to both the reference planes.	2	16-03-2026		TLM1	
14	Practice Session	3	18-03-2026		TLM4	
No. of classes required to complete UNIT-II: 20 (Lecture:6 Practice:9)				**No. of classes taken: (including Practice)**		

UNIT-III: PROJECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
16	Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to horizontal plane, Axis perpendicular to vertical plane – Theory	2	30-03-2026		TLM1	
17	Practice Session	3	01-04-2026		TLM4	
18	Axis parallel to both the reference planes, Projection of Solids with axis inclined to one reference plane and parallel to another plane.	2	06-04-2026		TLM1	
19	Practice Session	3	08-04-2026		TLM 4	
No. of classes required to complete UNIT-III: 07 (Lecture:4 Practice:6)				**No. of classes taken: (including Practice)**		

UNIT-IV: SECTIONS OF SOLIDS AND DEVELOPMENT OF SURFACES

S. No.	Topics to be covered	No. of Class Required	Tentative Date	Actual Date	Teaching Learning ng Method	HOD Sign Weekly
20	Sections of Solids Solids in simple positions, Perpendicular and inclined section planes	2	13-04-2026		TLM1	
21	Practice Session	2	20-04-2025		TLM4	
22	Sections of solids: Sectional views and True shape of section	3	22-04-2025		TLM1	
23	Development of solids Methods of Development: Parallel line development and radial line development	2	27-04-2025		TLM4	
24	Practice Session	3	29-04-2025		TLM1	
25	Development of solids Development of a cube, prism, cylinder, pyramid and cone.	2	04-05-2025		TLM4	
26	Practice Session	3	06-05-2025		TLM1	
No. of classes required to complete UNIT-IV: 18 (Lecture:06 Practice:08)				**No. of classes taken: (including Practice)**		

UNIT-V: CONVERSION OF VIEWS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date	Actual Date	Teaching Learning Methods	HOD Sign Weekly
27	Introduction to Isometric Views – Theory Isometric views, isometric axes, scale, lines & planes	2	11-05-2025		TLM1	
28	Practice Session	3	13-05-2025		TLM4	
29	Orthographic projections to Isometric Projections	2	01-06-2025		TLM1	
30	Practice Session	3	03-06-2025		TLM4	
31	Orthographic Projections to Isometric Projections	2	08-06-2025		TLM1	
32	Practice Session	3	10-06-2025		TLM4	
33	**Content beyond the syllabus:** Scales, Planes inclined to both the planes.				TLM1/ TLM2	
No. of classes required to complete UNIT-V: 1 (Lecture:06 Practice:09)				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, 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	**Engineer and society:** Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability:** Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work:** Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication:** Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance:** Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning:** Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Head of the Department
Name of the Faculty	Dr.B.Sudheer Kumar	Mr.J.Subba Reddy	Dr. M B S S Reddy
Signature			

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. N. V. Maha Lakshmi
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /C sec. **A.Y.:** 2025-26

PREREQUISITE: Data Structures-23CS02

COURSE EDUCATIONAL OBJECTIVES(CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	02-02-2026		TLM1	
2.	Definition and Importance of Linear Data Structures	1	05-02-2026		TLM1	
3.	Abstract Data Types and Implementation	1	06-02-2026		TLM1	
4.	Overview of time and space complexity	1	09-02-2026		TLM1	
5.	Analysis of Liner Data structures	2	12-02-2026 13-02-2026		TLM1	
6.	Revise Arrays	1	14-02-2026		TLM1	
7.	Searching Techniques: Linear Search	1	06-02-2026		TLM1	
8.	Binary Search & Analysis	2	19-02-2026 20-02-2026		TLM1	
9.	Bubble Sort & Analysis	1	21-02-2026		TLM1	
10.	Insertion Sort & Analysis	2	23-02-2026 26-02-2026		TLM1	
11.	Selection Sort & Analysis	2	27-02-2026 28-02-2026		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	02-03-2026		TLM1	
13.	Linked List Representation	1	05-03-2026		TLM1	
14.	Sing Linked List: Operations	2	06-03-2026 07-03-2026		TLM1	
15.	Double Linked List: Operations	2	09-03-2026 12-03-2026		TLM1	
16.	Circular Single Linked List	1	13-03-2026		TLM1	
17.	Circular Double Linked List	2	14-03-2026 16-03-2026		TLM1	
18.	Comparing Arrays and Linked List, Applications of Linked List	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 10				**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
19.	Introduction to Stacks: Properties	1	30-03-2026		TLM1	
20.	Operations of Stacks	1	02-04-2026		TLM1	
21.	Implementation of stacks using arrays	1	04-04-2026		TLM1	
22.	Stacks using Linked List	1	06-04-2026		TLM1	
23.	Expressions: Expression evaluation	2	09-04-2026 10-04-2026		TLM1	
24.	Infix to Postfix Conversion	2	11-04-2026 13-04-2026		TLM1	
25.	Checking Balanced Parenthesis	2	16-04-2026 17-04-2026		TLM1	
26.	Reversing a List	1	18-04-2026		TLM1	
27.	Backtracking	1	20-04-2026		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
28.	Introduction to queues: properties and operations,	1	23-04-2026		TLM1	
29.	Implementing queues using arrays	1	24-04-2026		TLM1	
30.	Implementing queues using Linked List	1	25-04-2026		TLM1	
31.	Applications of Queue: Scheduling	1	27-04-2026		TLM1	
32.	Breadth First Search	1	30-04-2026		TLM1	
33.	Circular Queue	1	01-05-2026		TLM1	
34.	Double ended queue	1	02-05-2026		TLM1	
35.	Applications of Deque	1	04-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Introduction to Trees,	1	07-05-2026		TLM1	
37.	Representation of Trees	1	08-05-2026		TLM1	
38.	Tree Traversals	1	09-05-2026		TLM1	
39.	Binary Search Trees- Operations	2	11-05-2026 14-05-2026		TLM1	

40.	Hashing Introduction	1	15-05-2026		TLM1	
41.	Hash Functions	1	16-05-2026		TLM1	
42.	Collison Resolution Techniques: Separate Chaining	1	01-06-2026		TLM1	
43.	Open Addressing: Linear Probing	1	04-06-2026		TLM1	
44.	Quadratic Probing, Double Hashing	1	05-06-2026		TLM1	
45.	Rehashing, Applications of Hashing	1	06-06-2026		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	1	08-06-2026					
No. of classes		1			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): 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 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
PART-A

Course Instructor	**:** P. Vijaya Sirisha/Dr. K. Kumar Raja	
Course Name & Code	**:** Engineering Physics Lab & 23FE053	**Credits:** 1
L-T-P Structure	**:** 0-0-**3**	**A.Y.:** 2025-26
Program/Sem./Branch	: B.Tech/I/CSE C	**Regulations**: R23

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

Course Outcomes:

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

Course Articulation Matrix (Correlation between COs, Pos & PSOs):

Course Designed by				Division of Physics, Freshman Engineering Department								
COs	**PO1**	**PO2**	**PO3**	**PO4**	**PO5**	**PO6**	**PO7**	**PO8**	**PO9**	**PO10**	**PO11**	**PO12**
CO1	3	3	2	1	-	-	-	1	1	-	-	1
CO2	3	3	2	1	-	-	-	1	1	-	-	1
CO3	3	3	2	1	-	-	-	1	1	-	-	1
CO4	3	3	2	1	-	-	-	1	1	-	-	1
CO5	3	3	2	1	-	-	-	1	1	-	-	1
1 = Slight (Low)				**2** = Moderate (Medium)				**3** = Substantial (High)				

List of Experiments

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

References:

T1: A Textbook of Practical Physics – S. Balasubramanian, M.N. Srinivasan, *S. Chand publishers,* 2017.
T2: BOS Approved Textbook**:** Lab Manual Prepared by LBRCE.

EVALUATION PROCESS

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

PART-B

Course Delivery Plan (Lesson Plan): ASE

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	T-L Methods	Learning Outcome COs	Textbook followed	HOD Sign
1.	Introduction	3	07-02-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
2.	Demonstration	3	14-02-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
3.	Experiment 1	3	21-02-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
4.	Experiment 2	3	28-02-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
5.	Demonstration	3	07-03-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
6.	Experiment 3	3	14-03-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
7.	Experiment 4	3	21-03-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
8.	Experiment 5	3	28-03-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
9	**MID-1 Exam**	3	04-04-2026		---	---	---	
10.	Experiment 6	3	11-04-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
11.	Experiment 7	3	18-04-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
12.	Experiment 8	3	25-04-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
13.	Repetition	3	02-05-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
14.	Experiment 9 (Virtual Lab)	3	09-05-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
15.	Experiment10 (Virtual Lab)	3	16-05-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
16.	Revision	3	06-06-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	
17.	Internal Exam	3	13-06-2026		TLM-4	CO1, CO2, CO3, CO4 & CO5	T1	

Teaching-Learning Methods

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

PROGRAM OUT COMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
P.Vijaya Sirisha	Dr. S. Yusuf	Dr. S. Yusuf	Dr. T. Satyanarayana

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Department of Electrical and Electronics Engineering
Accredited by NBA under Tier-I

COURSE HANDOUT
PART-A

Name of Course Instructor : K.Nagalinga Chary, G.Tabita , P.Deepak Reddy & P.Rathnakar Kumar
Course Name & Code : Electrical & Electronics Engineering Workshop -23EE51
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech-CSE/II/C-Section **A.Y.:** 2025-26

Course Objectives: 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-L3)
CO2	Compute medium resistance using Wheat stone bridge. (Apply-L3)
CO3	Discover critical field resistance and critical speed of DC shunt generators. (Apply-L3)
CO4	Estimate reactive power and power factor in electrical loads. (Understand-L2)
CO5	Plot the characteristics of semiconductor devices. (Apply-L3)
CO6	Demonstrate the working of various logic gates using ICs. (Understand-L2)

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

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	2	3	_	2	_	_	_	1	2	1	_	1	1	1	1	1
CO2	2	3		2				1	2	1						
CO3	2	3		2				1	2	1				2		
CO4	2	3		2				1	2	1		1	2	1		
CO5	2	3		2				1	2	1		1	2	2	2	2
CO6	2	2		2				1	2	1		1			2	1
1 - Low								**2 –**Medium						**3 -** High		

PART A: ELECTRICAL ENGINEERING LAB

List of experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator
5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger
7. Calculation of Electrical Energy for Domestic Premises

PART B: ELECTRONICS ENGINEERING LAB

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

Part - B

COURSE DELIVERY PLAN (LESSON PLAN):

SECTION-C SCHEDULE

DAY : THURSDAY

Batches: 25761A05C7 to 25761A0F7

Faculty: Mr.P.Deepak Reddy & Mr.P.Rathnakar Kumar

H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
Tentative date	05/02	12/02	19/02	26/02	05/03	12/03	02/04	09/04	16/04	23/04	30/04	07/05	14/05	04/06	11/06
Actual date															
25761A05C7 To 25761A05F7	Demo & 1	2	3	4	5,6	REVISION OF EXPERIMENTS	INTERNAL EXAM-I	7	8	9	10	11	12	REVISION OF EXPERIMENTS	INTERNAL EXAM-II
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		

PART-C

EVALUATION PROCESS (R20 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	50

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

DAY : THURSDAY

Batches: 25761A05F8 to 25761A05I7

Faculty: K.Nagalinga Chary & G.Tabita

H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week	XV Week
Tentative date	05/02	12/02	19/02	26/02	05/03	12/03	02/04	09/04	16/04	23/04	30/04	07/05	14/05	04/06	11/06
Actual date															
25761A05F8 To 25761A05I7	Demo & 1	2	3	4	5,6	REVISION OF EXPERIMENTS	INTERNAL EXAM-I	7	8	9	10	11	12	REVISION OF EXPERIMENTS	INTERNAL EXAM-II
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11	12		

PART-C

EVALUATION PROCESS (R20 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	50

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.

K.Nagalinga Chary G.Tabita P.Deepak Reddy Mr.P.Rathnakar Kumar	**Dr.AVGA Marthanda**	**Dr.G.Nageswara Rao**	**Dr.P.Sobha Rani**
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)

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

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

DEPARTMENTOFMECHANICALENGINEERING

COURSEHANDOUT

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

ACADEMICYEAR : 2025-26

COURSENAME&CODE : EngineeringWorkshop, 20ME51

L-T-PSTRUCTURE : 0-0-3

COURSECREDITS : 1.5

COURSEINSTRUCTOR :Mr. S.SrinivasaReddy, Sr. Assistant Professor,
Dr.LPrabhu, Assoc. Professor

COURSECOORDINATOR: SeelamSrinivasaReddy, Assoc. Professor

PRE-REQUISITE: Knowledgeindimensionsandunits,Usageofgeometricalinstrumentsand analyticalability

COURSEOBJECTIVE:

Theobjectiveofthiscourseistogetfamiliarizedwithvarioustradesusedin Engineering Workshopandlearnthesafetypre-cautionstobefollowedintheworkshops,whileworkingwiththedifferenttools.

COURSE OUTCOMES (CO)

CO1	Designand model differentprototypesinthecarpentrytrade such asCrosslapjoint,Dovetailjoint.
CO2	Fabricateandmodelvariousbasicprototypesinthetradeoffittingsuch asStraight fit,V-fit.
CO3	Producevarious basic prototypes in the trade of Tin smithy such as Rectangulartray,andopenCylinder.
CO4	PerformvariousbasicHouseWiringtechniques.

COURSEARTICULATIONMATRIX(CorrelationbetweenCos&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: EnterCorrelationLevels**1**or**2**or**3.**Ifthereisnocorrelation,**put"1**Slight (Low),**2-**Moderate (Medium),**3-**Substantial (High).

REFERENCE:

R1	LabManual

COURSEDELIVERYPLAN(LESSONPLAN):(BATCH-A1)

S.No.	Experimenttobeconducted	No. ofClasses Required	TentativeDate of Completion	ActualDate ofCompletion	Teaching Learning Methods	Reference	HODSign Weekly
1.	Induction Program	3	06-02-2026		TLM8	-	
2.	Demonstration	3	06-02-2026		TLM8	R1	
3.	Experiment-1	3	13-02-2026		TLM8	R1	
4.	Experiment-2	3	20-02-2026		TLM8	R1	
5.	Experiment-3	3	27-02-2026		TLM8	R1	
6.	Experiment-4	3	06-03-2026		TLM8	R1	
I-Mid Examinations (23-03-2026 to 28-03-2026)							
7.	Experiment-5	3	13-03-2026		TLM8	61	
8.	Experiment-6	3	20-03-2026		TLM8	R1	
9.	Experiment-7	3	27-032026		TLM8	R1	
10.	Experiment-8	3	10-04-2026		TLM8	R1	
11.	Experiment-9	3	17-04-2026		TLM8	R1	
12.	Repetition lab	3	24-04-2026		TLM8	--	
13.	Lab Internal	3			TLM6	--	

COURSEDELIVERYPLAN(LESSONPLAN):(BATCH-A2)

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction Program	3	06-02-2026		TLM8	-	
2.	Demonstration	3	06-02-2026		TLM8	R1	
3.	Experiment-1	3	13-02-2026		TLM8	R1	
4.	Experiment-2	3	20-02-2026		TLM8	R1	
5.	Experiment-3	3	27-02-2026		TLM8	R1	
	Experiment-4	3	06-03-2026		TLM8	R1	
I-Mid Examinations (23-03-2026 to 28-03-2026)							
6.	Experiment-4	3	13-03-2026		TLM8	R1	
7.	Experiment-5	3	20-03-2026		TLM8	61	
8.	Experiment-6	3	27-032026		TLM8	R1	
9.	Experiment-7	3	10-04-2026		TLM8	R1	
10.	Experiment-8	3	17-04-2026		TLM8	R1	
11.	Experiment-9	3	24-04-2026		TLM8	R1	
12.	Repetition lab	3	01-05-2026		TLM8	--	
13.	Lab Internal	3			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	02-02-2026	31-03-2026	7W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	7W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practical's	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	2W

Part-C

EVALUATIONPROCESS:

Parameter	Marks
Day–to–DayWork	A1=10 Marks
Record And Observation	B1= 05 Marks
InternalTest	C1 = 15 Marks
Cumulative Internal Examination (CIE = A1 + B1 + C1)	A1+B1+C1=30Marks
SemesterEndExaminations (SEE)	D1 = 70 Marks
TotalMarks:A1+B1+C1+D1	100Marks

Details of Batches: A-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
A11	25761A005C7-05D4	8	A21	25761A05F7-05G4	8
A12	25761A005D5-05E1	7	A22	25761A05G5-05H1	7
A13	25761A005E2-05E9	8	A23	25761A05H2-05H9	8
A14	25761A05F0-05F6	7	A24	25761A05I0-05I7	8

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09
A11	F1	F2	P1	P2	C1	C2	E1	E2	T1
A12	F2	F1	P2	P1	C2	C1	E2	E1	T1
A13	P1	P2	C1	C2	E1	E2	F1	F2	T1
A14	P2	P1	C2	C1	E2	E1	F2	F1	T1
A21	C1	C2	E1	E2	F1	F2	P1	P2	T1
A22	C2	C1	E2	E1	F2	F1	P2	P1	T1
A23	E1	E2	F1	F2	P1	P2	C1	C2	T1
A24	E2	E1	F2	F1	P2	P1	C2	C1	T1

LIST OF EXPERIMENTS:

Exp. No.	Name of the Experiment	Related CO
1.	Carpentry-1(C1)-Corner Bridle Joint	CO1
2.	Carpentry-2(C2)-Dove Tail Joint	CO1
3.	Fitting-1(F1)-L-**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
9.	Tinsmity-1(T1)- Rectangular Tray	CO2
10.	Demonstration- Welding and Foundry	CO2

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Mr. S.Srinivasa Reddy Dr.L.Prabhu	**Mr. Seelam.Srinivasa Reddy**	**Mr. J.Subba Reddy**	**Dr. M. B. S Sreekara Reddy**

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. N. V. Maha Lakshmi
Course Name & Code **:** DATA STRUCTURES LAB & 23CS52
L-T-P Structure **: 0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/C sec. **A.Y.:** 2025-26

PREREQUISITE: Introduction to Programming, Computer Programming Lab

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Delivery Method	HOD Sign
1.	Array Manipulations	3	03-02-2026		TLM4	
2.	Searching and Sorting Techniques	3	10-02-2026		TLM4	
3.	Single Linked List	3	17-02-2026		TLM4	
4.	Double Linked List	3	24-02-2026		TLM4	
5.	Circular Linked List	3	10-03-2026		TLM4	
6.	Polynomial Representation & Polynomial Addition	3	17-03-2026		TLM4	
7.	Linked List Applications	3	31-03-2026		TLM4	
8.	Stack Implementation	3	07-04-2026		TLM4	
9.	Stack Applications	3	21-04-2026		TLM4	
10.	Queue Implementation & Circular Queue	3	28-04-2026		TLM4	
11.	Double Ended Queue	3	05-05-2026		TLM4	
12.	Trees	3	12-05-2026		TLM4	
13.	Hashing	3	02-06-2026		TLM4	
14.	Internal Exam	3	09-06-2026		TLM4	

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**: I B. Tech., II-Sem., CSE-D**
ACADEMICYEAR	**: 2025-26**
COURSENAME &CODE	**: ENGINEERING PHYSICS - 23FE04**
L-T-PSTRUCTURE	**: 4-0-0**
COURSECREDITS	**: 3**
COURSEINSTRUCTOR	**: Dr. N. Aruna**
PRE-REQUISITE	**: Basic Knowledge of Physics**

Course Objectives:

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

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

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

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

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

TEXT BOOKS

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

REFERENCES

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

WEBRESOURCES

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

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

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE, DIFFRACTION& POLARIZATION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Introduction to the Subject, Course Outcomes	1	03-02-2026		**TLM-2**		
2	Principle of superposition, Interference of light	1	04-02-2026		**TLM-3**		
3	Interference in thin films by reflection & applications	1	05-02-2026		**TLM-2**		
4	Colors in thin films, Newton's rings	1	07-02-2026		**TLM-1**		
5	Determination of wavelength and refractive index	1	10-02-2026		**TLM-4**		
6	Introduction, Fresnel and Fraunhoffer diffractions	1	11-02-2026		**TLM-1**		

7	Fraunhoffer diffraction due to single slit	1	12-02-2026		**TLM-3**		
8	Double slit& N slits(Qualitative)	1	14-02-2026		**TLM-2**		
9	Tutorial	1	17-02-2026		**TLM-4**		
10	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	18-02-2026		**TLM-3**		
11	Introduction – Types of polarization	1	19-02-2026		**TLM-2**		
12	Polarization by reflection, refraction & double refraction	1	21-02-2026		**TLM-2**		
13	Tutorial	1	24-02-2026		**TLM-2**		
14	Nicol's prism	1	25-02-2026		**TLM-3**		
15	Half wave and Quarter wave plates	1	26-02-2026		**TLM-2**		
No.of classes required to complete UNIT-I:15				No.of classes taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Space lattice; Basis, Unit cell & Lattice parameters	1	28-02-2026		**TLM-2**		
2	Bravais Lattices , Crystal Systems(3D)	1	03-03-2026		**TLM-2**		
3	Coordination number – Packing fraction of –SC, BCC	1	05-03-2026		**TLM-2**		
4	Coordination number – Packing fraction of FCC	1	07-03-2026		**TLM-1**		
5	Tutorial	1	10-03-2026		**TLM-1**		
6	Miller indices& Properties Separation between successive (hkl) planes	1	11-03-2026		**TLM-3**		

7	Bragg's law; X–ray Diffractometer	1	12-03-2026		**TLM-1**		
8	Crystal Structure determination by Laue's method	1	14-03-2026		**TLM-2**		
9	Crystal Structure determination by Powder method		17-03-2026		**TLM-2**		
10	Tutorial	1	18-03-2026		**TLM-3**		
No.of classes required to complete UNIT-II: 10			No.of classes taken:				

UNIT-III :DIELECTRIC & MAGNETIC MATERIALS

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

S.No	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Dielectric polarization Dielectric polarizability, Susceptibility	1	31-03-2026		**TLM-2**		
2	Dielectric constant & Displacement Vector, Relation between the electric vectors	1	01-04-2026		**TLM-3**		
3	Types of polarizations-Electronic polarization	1	02-04-2026		**TLM-1**		
4	Types of polarizations- ionic & orientation polarizations (Qualitative)	1	04-04-2026		**TLM-1**		
5	Lorentz internal field	1	07-04-2026		**TLM-2**		
6	Claussius-Mosotti equation, Complex dielectric constant	1	08-04-2026		**TLM-1**		
7	Frequency dependence of polarization dielectric loss	1	09-04-2026		**TLM-5**		
8	Tutorial	1	11-04-2026		**TLM-3**		
9	Introduction Magnetic dipole moment, Magnetization Magnetic	1	15-04-2026		**TLM-4**		

	susceptibility & permeability						
10	Atomic origin of magnetism	1	16-04-2026		**TLM-1**		
11	Classification of magnetic materials-Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	18-04-2026		**TLM-2**		
12	Tutorial	1	21-04-2026		**TLM-3**		
13	Domain concept for Ferromagnetism & Domain walls	1	22-04-2026		**TLM-5**		
14	Hysteresis loop	1	23-04-2026		**TLM-1**		
15	Soft and hard magnetic materials	1	25-04-2026		**TLM-3**		
No.of classes required to complete UNIT-III: 15				No.of classes taken:			

UNIT-IV :QUANTUM MECHANICS & FREE ELECTRON THEORY

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Dual nature of matter,De-Broglie's Hypothesis	1	28-04-2026		**TLM-3**		
2	Heisenberg's Uncertainty Principle	1	29-04-2026		**TLM-2**		
3	Significance & properties of wave function	1	30-04-2026		**TLM-2**		
4	Schrodinger's time independent and dependent wave equations	1	02-05-2026		**TLM-1**		
5	Tutorial	1	05-05-2026		**TLM-3**		
6	Particle in a one – dimensional infinite potential well	1	06-05-2026		**TLM-3**		
7	Classical free electron theory-merits and demerits, Quantum free electron theory	1	07-05-2026		**TLM-2**		
8	Electrical conductivity based on quantum free electron theory	1	09-05-2026		**TLM-1**		
9	Tutorial	1	12-05-2026		**TLM-5**		
10	Fermi -Dirac distribution and	1	13-05-2026		**TLM-1**		

	temperature dependence						
11	Density of states, Fermi energy	1	14-05-2026		**TLM-3**		
No.of classes required to complete UNIT-IV:11				No.of classes taken:			

UNIT-V: SEMICONDUCTOR PHYSICS

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1	Formation of energy bands, Classification of crystalline solids	1	16-05-2026		**TLM-6**		
2	Intrinsic semiconductors, Density of charge carriers	1	02-06-2026		**TLM-3**		
3	Extrinsic semiconductors, Density of charge carriers	1	03-06-2026		**TLM-2**		
4	Dependence of Fermi energy on carrier concentration &temperature	1	04-06-2026		**TLM-1**		
5	Tutorial	1	06-06-2026		**TLM-3**		
6	Drift and Diffusion Currents, Einstein's equation	1	09-06-2026		**TLM-1**		
7	Hall Effect & its applications	1	10-06-2026		**TLM-1**		
8	Tutorial	1	11-06-2026		**TLM-3**		
9	Revision	1	13-06-2026		**TLM-3**		
No.of classes required to complete UNIT-V:09				No. of classes taken:			

PART-C

EVALUATION PROCESS(R-23Regulation)

Evaluation Task	Marks
Assignment-I (Units-I, II)	A1=**5**
I-Descriptive Examination (Units-I, II)	M1=**15**
I-Quiz Examination (Units-I, II)	Q1=**10**
Assignment-II (Unit-III, IV & V)	A2=**5**

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

PART-D

PROGRAMMEOUTCOMES(POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals,andanengineeringspecializationtothesolutionofcomplex engineeringproblems.
PO 2	**Problem analysis**:Identify,formulate,reviewer search literature,and analyze complexengineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics,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 needswithappropriateconsiderationforthepublichealthandsafety,and the cultural, societal,and environmental considerations.
PO 4	**Conductivestigations 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 assesssocietal, health,safety,legal and cultural is sues and the consequent responsibilitiesrelevanttotheprofessionalengineeringpractice
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	**Individualandteamwork**:Functioneffectivelyasanindividual,andasamember orleaderindiverseteams,andinmultidisciplinarysettings.
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 amember and lead erina team,to manageprojectsandinmultidisciplinary environments.
PO 12	**Life-long learning**:Recognizetheneedforandhavethepreparationandabilityto engageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

Course Instructor Course Coordinator Module Coordinator HOD

Dr. N.Aruna **Dr.S.Yusub** **Dr.S.Yusub** **Dr.T.Satyanarayana**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC with "A" Grade & NBA for ASE, CE, CSE, ECE, EEE, ME & IT (Under Tier - I)
An ISO 21001:2018, 14001:2015, 50001:2018 Certified Institution
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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	05-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	06-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	09-02-2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	12-02-2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	13-02-2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	14-02-2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	16-02-2026		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	17-02-2026		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	19-02-2026		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	20-02-2026		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	21-02-2026		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	23-02-2026		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	24-02-2026		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	26-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	27-02-2026		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	28-03-2026		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	02-03-2026		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	05-03-2026		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	06-03-2026		TLM1	CO1	T1,T2	
24.	P.I for $e^{ax+b}v(x)$	1	07-03-2026		TLM1	CO1	T1,T2	

25.	P.I for $x^k v(x)$	1	09-03-2026		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	10-03-2026		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	12-03-2026		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	13-03-2026		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	14-03-2026		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	16-03-2026		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	17-03-2026		TLM1	CO1	T1,T2	
32.	TUTORIAL - II	1	20-03-2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	30-03-2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	31-03-2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary functions	1	02-04-2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	04-04-2026		TLM1	CO2	T1,T2	
37.	Solving of PDE	1	06-04-2026		TLM1	CO2	T1,T2	
38.	Lagrange's Method	1	07-04-2026		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	09-04-2026		TLM1	CO2	T1,T2	
40.	Homogeneous Linear PDE with constant coefficients	1	10-04-2026		TLM1	CO2	T1,T2	
41.	TUTORIAL - III	1	11-04-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
42.	Introduction to UNIT IV	1	13-04-2026		TLM1	CO3	T1,T2	
43.	Vector Differentiation	1	16-04-2026		TLM1	CO3	T1,T2	
44.	Gradient	1	17-04-2026		TLM1	CO3	T1,T2	
45.	Directional Derivative	1	18-04-2026		TLM1	CO3	T1,T2	
46.	Directional Derivative	1	20-04-2026		TLM1	CO3	T1,T2	
47.	Divergence	1	21-04-2026		TLM1	CO3	T1,T2	

48.	Curl	1	23-04-2026		TLM1	CO3	T1,T2	
49.	Problems	1	24-04-2026		TLM1	CO3	T1,T2	
50.	Solenoidal fields, Irrotational fields, potential surfaces	1	25-04-2026		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	27-04-2026		TLM1	CO3	T1,T2	
52.	Laplacian, second order operators	1	28-04-2026		TLM1	CO3	T1,T2	
53.	Vector Identities	1	30-04-2026		TLM1	CO3	T1,T2	
54.	Vector Identities	1	01-05-2026		TLM1	CO3	T1,T2	
55.	TUTORIAL IV	1	01-05-2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	02-05-2026		TLM1	CO4	T1,T2	
58.	Line Integral	1	04-05-2026		TLM1	CO4	T1,T2	
59.	Circulation	1	05-05-2026		TLM1	CO4	T1,T2	
60.	Work done	1	07-05-2026		TLM1	CO4	T1,T2	
61.	Surface Integral	1	08-05-2026		TLM1	CO4	T1,T2	
62.	Surface Integral	1	09-05-2026		TLM1	CO4	T1,T2	
63.	Flux	1	11-05-2026		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	12-05-2026		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	14-05-2026		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	3	15-05-2026 16-05-2026 01-06-2026		TLM1	CO4	T1,T2	
67.	Divergence Theorem	3	02-06-2026 04-06-2026 05-06-2026		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	06-06-2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		16			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	3	08-06-2026 09-06-2026 11-06-2026		TLM2	CO2	T1,T2	
70.	REVISION		12-06-2026 13-06-2026					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

Sk Haseena Begum	**Dr. K. Jhansi Rani**	**Dr. A. RAMI REDDY**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.Nagalinga Chary
Course Name & Code : Basic Electrical & Electronics Engineering – 23EE01
L-T-P Structure : **3-0-0** **Credits:** 3
Program/Branch/Sem/Sec : B.Tech /CSE, D Sec II SEM **A.Y.:** 2025-26
Pre-requisites: Physics

Course Educational Objectives:

- 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. **(Understand)**
	PART-B
CO4	Interpret the characteristics of various semiconductor devices. **(Knowledge)**
CO5	Infer the operation of rectifiers, amplifiers. **(Understand)**
CO6	Contrast various logic gates, sequential and combinational logic circuits. **(Understand)**

CO-PO Articulation Matrix: (Correlation between COs, POs & PSOs):

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	3	3										1	2	1		1
CO2	3											1	2	3		1
CO3	3	2				1	1				1	1	2			
CO4	3	2										1	1		2	2
CO5	3	2										1	2		3	1
CO6	2	2	2									1	2		2	2
1 - Low							**2** –Medium						**3 -** High			

Textbooks:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013
3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition
4. R. L. Boylestad & Louis Nashlesky, Electronic Devices & Circuit Theory, Pearson Education,
5. R. P. Jain, Modern Digital Electronics, 4th Edition, Tata Mc Graw Hill, 2009

Reference Books:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

ELECTRICAL ENGINEERING

UNIT-I: DC & AC CIRCUITS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**DC Circuits:** Introduction:PEOs,PO&PSOs,COs	1	02-02-2026			
2.	Electrical circuit elements	1	03-02-2026		TLM1	
3.	KCL & KVL,Ohm's Law and its limitations	1	06-02-2026		TLM1	
4.	series, parallel, series-parallel circuits	1	07-02-2026		TLM1	
5.	Super Position theorem	1	09-02-2026		TLM1	
6.	**AC Circuits:** Equation of AC Voltage and current, waveform, time period, frequency, amplitude, phase, phase difference	1	10-02-2026		TLM1	
7.	average value, RMS value, form factor, peak factor	2	13-02-2026 14-02-2026		TLM2	
8.	Impedance,Power,Power factor RLC Circuits	2	16-02-2026 17-02-2026		TLM1	
9.	Simple numerical problems	1	20-02-2026		TLM3	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT – II: MACHINES AND MEASURING INSTRUMENTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	**Machines:** Construction, principle and operation of (i) DC Motor	1	21-02-2026		TLM2	
11.	Construction, principle and operation of (ii) DC Generator.	1	23-02-2026		TLM2	
12.	Single Phase Transformer	1	24-02-2026		TLM2	
13.	Three Phase Induction Motor	1	27-02-2026		TLM2	
14.	Alternators, Applications of electrical machines	1	28-02-2026		TLM2	
15.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	02-03-2026		TLM2	
16.	Moving Iron (MI) Instruments & Wheatstone bridge	1	06-03-2026		TLM2	
No. of classes required to complete UNIT-II: 07				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
17.	Conventional and non-conventional energy resources, Hydel & Nuclear power generation	1	07-03-2026		TLM2	
18.	Solar & Wind power plants	1	09-03-2026		TLM2	

19.	Power rating of household appliances including air conditioners, PCs, Laptops, Printers, etc	1	10-03-2026		TLM2	
20.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, calculation of electricity bill for domestic consumers.	2	13-03-2026 14-03-2026		TLM2	
21.	Working principle of Fuse and Miniature circuit breaker (MCB), merits and demerits.	1	16-03-2026		TLM2	
22.	Personal safety measures: Electric Shock, Earthing and its types& Safety Precautions	1	17-03-2026		TLM2	
23.	**Beyond the Syllabus**: Thermal Power Plant	1	21-03-2026			
No. of classes required to complete UNIT-III: 8				**No. of classes taken:**		

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

ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction – Course Outcomes	1	30-03-2026		TLM1	
2.	Evolution of electronics, Vacuum tubes to nano electronics	1	31-03-2026		TLM1	
3.	Characteristics of PN Junction Diode	1	04-04-2026		TLM1	
4.	Zener Effect — Zener Diode	1	06-04-2026		TLM1	
5.	Zener Effect — Zener Diode and its Characteristics	2	07-04-2026 10-04-2026		TLM1	
6.	Bipolar Junction Transistor	1	11-04-2026		TLM1	
7	CB Configurations and Characteristics	1	13-04-2026		TLM2	
8.	CE,CC Configurations and Characteristics.	2	17-04-2026 18-04-2026		TLM2	
9	Elementary Treatment of Small Signal CE Amplifier.	2	20-04-2026 21-04-2026		TLM1	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	24-04-2026		TLM1	
11	Working of full wave bridge rectifier, capacitor filter (no analysis)	2	25-04-2026 27-04-2026		TLM1	
12	Working of simple Zener voltage regulator.	1	28-04-2026		TLM1	
13	**Amplifiers**: Block diagram of Public Address system	2	01-05-2026 02-05-2026		TLM2	

14	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	04-05-2026		TLM2	
15	**Electronic Instrumentation:** Block diagram of an electronic instrumentation system.	1	05-05-2026		TLM2	
No. of classes required to complete UNIT-II: 8				**No. of classes taken:**		

UNIT-III: Digital Electronics

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
16	Overview of Number Systems	1	08-05-2026		TLM1	
17	Logic gates including Universal Gates	1	09-05-2026		TLM2	
18	BCD codes, Excess-3 code	1	11-05-2026		TLM1	
19	Gray code, Hamming code	1	12-05-2026		TLM1	
20	Boolean Algebra basics	1	15-05-2026		TLM1	
21	Basic Theorems and properties of Boolean Algebra	1	16-05-2026		TLM2	
22	Simple combinational circuits	1	01-06-2026		TLM1	
23	Half and Full Adders	1	02-06-2026		TLM1	
24	Introduction to sequential circuits, Flip flops,	2	05-06-2026 06-06-2026		TLM2	
25	Registers and counters	2	08-06-2026 09-06-2026		TLM2	
26	Review	1	12-06-2026		TLM1	
27	**Beyond the syllabus:** Operational Amplifier	1	13-06-2026		TLM1	
No. of classes required to complete UNIT-III: 14				**No. of classes taken:**		

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

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Mr.K.Nagalinga Chary	Dr. AVGA Marthanda	Dr. G.Nageswara Rao	Dr. P.Sobha Rani
Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**

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

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF COMPUTER SCIENCE ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.K.V.Viswanadh,
Dr. V.Dhana Raju,
Mr. S.Srinivasa Reddy

Course Name & Code : Engineering Graphics – 20ME01
L-T-P Structure : 2-0-3 **Credits:** 3
Program/Sem/Sec : B.Tech/II Sem/CSE D-Section **A.Y.:** 2025-26
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	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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, COs, CEOs, POs and PEOs, Principles of Engineering Graphics and their significance, Drawing Instruments and their Use-Conventions in Drawing, Practice, Lettering and Dimensioning – BIS conventions.	2	04-02-2026		TLM1	
2.	Geometrical Constructions, Practice	3	06-02-2026		TLM1	
3.	Engineering Curves: Conic Sections- Ellipse, Parabola, Hyperbola General Methods Construction of Ellipse Practice	2	11-02-2026		TLM1	
4.	Construction of Parabola & Hyperbola Practice	3	13-02-2026		TLM1	
5.	Involute Curves-Practice	2	18-02-2026		TLM1	
6.	Introduction to Engineering Curves, conics Cycloid, Epicycloid and Hypocycloid and Practice; Practice	3	20-02-2026		TLM1	
7.	**ORTHOGRAPHIC PROJECTIONS** Introduction to Orthographic Projections, First and third angle projection methods Projections of Points-Practice	2	25-02-2026		TLM1	
No. of classes required to complete UNIT-I: 17				**No. of classes taken:**		

UNIT-II: ORTHOGRAPHIC PROJECTIONS OF POINTS AND LINES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
8.	**UNIT II: Projections of straight lines** Projections of straight lines of different orientations when line is parallel to one and inclined to the other, Practice	3	27-02-2026		TLM1, 3	
9.	Projections of lines when inclined to both the planes	2	04-03-2026		TLM1	
10.	Projections of lines when inclined to both the planes-Practice	3	06-03-2026		TLM1	

11.	**PROJECTIONS OF PLANES:** Introduction to Projection of Planes Planes parallel to one of the reference planes, Practice	2	11-03-2026		TLM1	
12.	Inclined to one reference plane and perpendicular to other	3	13-03-2026		TLM1	
13.	Inclined to one reference plane and perpendicular to other, Practice Revision- Unit-I & II	2	18-03-2026		TLM1	
No. of classes required to complete UNIT-II: 15				**No. of classes taken:**		

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
14.	**PROJECTIONS OF SOLIDS –** Introduction to Projections of Solids, Practice	2	01-04-2026		TLM1, 3	
15.	Projection of solids in simple positions, resting on HP, Practice Projection of solids in simple positions, resting on VP, Practice	2	08-04-2026		TLM1, 3	
16.	Axis inclined to one of the reference planes and parallel to the other, Practice	3	10-04-2026		TLM1, 3	
17.	Axis inclined to one of the reference planes and parallel to the other, Practice	2	15-04-2026		TLM1	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

UNIT-IV: SECTIONS OF SOLIDS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Perpendicular and inclined section planes	3	17-04-2026		TLM1, 3	
19.	Sections of solids in simple position Sectional views and true shape of section	2	22-04-2026		TLM1,3	
20.	DEVELOPMENT OF SURFACES: Methods of development: Parallel line development	3	24-04-2026		TLM3	
21.	Radial line development	2	29-04-2026		TLM1	
22.	Development of a cube, prism, cylinder, pyramid and cone.	3	01-05-2026		TLM1,3	
No. of classes required to complete UNIT-IV: 13				**No. of classes taken:**		

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	**UNIT V: ISOMETRIC VIEWS –** Introduction to Isometric Views, Practice Theory of isometric projection, isometric views, isometric axes, scale, lines & planes, Practice Isometric view of prism, pyramid, cylinder & cone, non-isometric lines- methods to generate an isometric drawing, Practice	2	06-05-2026		TLM1, 3	
25.	**TRANSFORMATION OF PROJECTIONS:** Introduction Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	3	08-05-2026		TLM1,3	
26.	Conversion of Isometric Views to Orthographic Projections of composite objects, Practice	2	13-05-2026		TLM3	
27.	Conversion of Orthographic Projections to Isometric Views of composite objects, Practice	3	15-05-2026		TLM1,3	
No. of classes required to complete UNIT-V: 13				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

Engineering Graduates will be able to:

PO 1	**Engineering Knowledge:** Apply knowledge of mathematics, natural science, computing, engineering fundamentals and an engineering specialization as specified in WK1 to WK4 respectively to develop to the solution of complex engineering problems.
PO 2	**Problem Analysis:** Identify, formulate, review research literature and analyze complex engineering problems reaching substantiated conclusions with consideration for sustainable development. (WK1 to WK4)
PO 3	**Design/Development of Solutions:** Design creative solutions for complex engineering problems and design/develop systems/components/processes to meet identified needs with consideration for the public health and safety, whole-life cost, net zero carbon, culture, society and environment as required. (WK5)
PO 4	**Conduct Investigations of Complex Problems:** Conduct investigations of complex engineering problems using research-based knowledge including design of experiments, modelling, analysis & interpretation of data to provide valid conclusions. (WK8).
PO 5	**Engineering Tool Usage:** Create, select and apply appropriate techniques, resources and modern engineering & IT tools, including prediction and modelling recognizing their limitations to solve complex engineering problems. (WK2 and WK6)
PO 6	**The Engineer and The World:** Analyze and evaluate societal and environmental aspects while solving complex engineering problems for its impact on sustainability with reference to economy, health, safety, legal framework, culture and environment. (WK1, WK5, and WK7).
PO 7	**Ethics:** Apply ethical principles and commit to professional ethics, human values, diversity and inclusion; adhere to national & international laws. (WK9)
PO 8	**Individual and Collaborative Team work:** Function effectively as an individual, and as a member or leader in diverse/multi-disciplinary teams.
PO 9	**Communication:** Communicate effectively and inclusively within the engineering community and society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations considering cultural, language, and learning differences
PO 10	**Project Management and Finance:** Apply knowledge and understanding of engineering management principles and economic decision-making and apply these to one's own work, as a member and leader in a team, and to manage projects and in multidisciplinary environments.
PO 11	**Life-Long Learning:** Recognize the need for, and have the preparation and ability for i) independent and life-long learning ii) adaptability to new and emerging technologies and iii) critical thinking in the broadest context of technological change. (WK8)

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Mr. K. V. Viswanadh	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. M.B.S.S. Reddy
Signature				

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr.M.Kiran Kumar
Course Name & Code **:** DATA STRUCTURES & 23CS02
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /D **A.Y.:** 2025-26

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	02-02-2026		TLM1	
2.	Definition and Importance of Linear Data Structures	1	05-02-2026		TLM1	
3.	Abstract Data Types and Implementation	1	06-02-2026		TLM1	
4.	Overview of time and space complexity	1	07-02-2026		TLM1	
5.	Analysis of Liner Data structures	2	09-02-2026 12-02-2026		TLM1	
6.	Revise Arrays	1	13-02-2026		TLM1	
7.	Searching Techniques: Linear Search	1	16-02-2026		TLM1	
8.	Binary Search & Analysis	2	02-02-2026 06-02-2026		TLM1	
9.	Bubble Sort & Analysis	1	07-02-2026		TLM1	
10.	Insertion Sort & Analysis	2	08-02-2025 12-02-2026		TLM1	
11.	Selection Sort & Analysis	2	13-02-2026 16-02-2026		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	19-02-2026		TLM1	
13.	Linked List Representation	1	20-02-2026		TLM1	
14.	Sing Linked List : Operations	2	21-02-2026 23-02-2026		TLM1	
15.	Double Linked List : Operations	2	26-02-2026 27-02-2026		TLM1	
16.	Circular Single Linked List	1	28-02-2026		TLM1	
17.	Circular Double Linked List	2	02-03-2026 05-03-2026		TLM1	
18.	Comparing Arrays and Linked List	1	06-03-2026 07-03-2026		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	09-03-2026 12-03-2026		TLM1	
20.	Polynomial Addition	1	13-03-2026 16-03-2026		TLM1	
No. of classes required to complete UNIT-II: 15				**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	30-03-2026		TLM1	
22.	Operations of Stacks	1	02-04-2026		TLM1	
23.	Implementation of stacks using arrays	1	04-04-2026		TLM1	
24.	Stacks using Linked List	1	06-04-2026		TLM1	
25.	Expressions: Expression evaluation	2	09-04-2026 10-04-2026		TLM1	
26.	Infix to Postfix Conversion	2	13-04-2026 04-04-2026		TLM1	
27.	Checking Balanced Parenthesis	2	09-04-2026 13-04-2026		TLM1	
28.	Reversing a List	1	16-04-2026		TLM1	
29.	Backtracking	1	17-04-2026		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	18-04-2026		TLM1	
31.	Implementing queues using arrays	1	20-04-2026		TLM1	
32.	Implementing queues using Linked List	1	23-04-2026		TLM1	
33.	Applications of Queue : Scheduling	1	24-04-2026		TLM1	
34.	Breadth First Search	1	25-04-2026		TLM1	
35.	Circular Queue	1	27-04-2026		TLM1	
36.	Double ended queue	1	30-04-2026 02-05-2026		TLM1	
37.	Applications of Deque	1	04-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 9				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	07-05-2026		TLM1	
39.	Representation of Trees	1	08-05-2026		TLM1	
40.	Tree Traversals	1	11-05-2026		TLM1	
41.	Binary Search Trees-Operations	2	14-05-2026 15-05-2026		TLM1	
42.	Hashing Introduction	1	01-06-2026		TLM1	
43.	Hash Functions	1	04-06-2026		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	05-06-2026		TLM1	
45.	Open Addressing: Linear Probing	1	06-06-2026		TLM1	
46.	Quadratic Probing, Double Hashing	1	08-06-2026		TLM1	
47.	Rehashing, Applications of Hashing	1	11-06-2026		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	1	12-06-2026					
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)								

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Mr.M.Kiran Kumar**	**Dr. Y.V.B Reddy**	**Dr. Y.V.B Reddy**	**Dr. S.Nagarjuna Reddy**
Signature				

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	:	**B. Tech., II-Sem., CSE-D**
ACADEMICYEAR	:	**2025-26**
COURSENAME &CODE	:	**ENGINEERING PHYSICS LAB - 23FE53**
L-T-PSTRUCTURE	:	**0 – 0 – 3**
COURSECREDITS	:	**1**
COURSEINSTRUCTOR	:	**Dr. N. Aruna &Dr.P.Sobana Chalam**
COURSECOORDINATOR	:	**Dr. S. Yusuf**
Pre-requisites	:	**Nil**

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

Course Outcomes:

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

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

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

List of Experiments

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

References:

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

BOSAPPROVEDTEXTBOOKS:

1. Lab Manual Prepared by the LBRCE.

EVALUATIONPROCESS:

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

Part B

Course Delivery Plan (Lesson Plan):

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	TeachingLearningMethods	Learning OutcomeCOs	Text Book followed	HOD Sign
1.	Introduction to CO's	3	05-02-2026		TLM-4	CO1,CO2,CO3,CO4 & CO5	T1	
2.	Demonstration	3	12-02-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
3.	Experiment 1	3	19-02-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
4.	Experiment 2	3	26-02-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
5.	Experiment 3	3	05-03-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
6.	Experiment 4	3	12-03-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
7.	Experiment 5	3	02-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
8.	Repetition lab	3	09-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
10.	Experiment 6	3	16-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
11.	Experiment 7	3	23-04-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
12.	Experiment 8	3	30-05-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
13.	Experiment 9	3	07-05-2026		TLM-4	CO1,CO2,CO3,CO4 & CO5	T1	
15	Experiment 10	3	14-05-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
16	Internal Exam	3	04-06-2026		TLM-4	CO1,CO2,CO3,CO4& CO5	T1	
17	Internal Exam	3	11-06-2026		TLM-3	CO1,CO2,CO3,CO4& CO5	T1	

PROGRAM OUT COMES: Engineering Graduates will be able to:

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

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

and engineering sciences.

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

4 **Conduct investigations 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 assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.

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

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

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

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

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

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

Course Instructor	Course- coordinator	Module Coordinator	HOD
13. Dr. N. Aruna & Dr.P.Sobana Chalam	Dr.S.Yusub	Dr. S. Yusub	Dr.T. Satyanarayana

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

COURSE HANDOUT
PART-A

Name of Course Instructor : Dr.M.Umavani ,Mr.K.Nagalinga Chary, Mr.A.V.Ravi Kumar & P. Rathnakar Kumar
Course Name & Code : Electrical & Electronics Engineering Workshop -23EE51
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech-CSE/II/D-Section **A.Y.:** 2025-26

Course Objectives: 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-L3)
CO2	Compute medium resistance using Wheat stone bridge. (Apply-L3)
CO3	Discover critical field resistance and critical speed of DC shunt generators. (Apply-L3)
CO4	Estimate reactive power and power factor in electrical loads. (Understand-L2)
CO5	Plot the characteristics of semiconductor devices. (Apply-L3)
CO6	Demonstrate the working of various logic gates using ICs. (Understand-L2)

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

CO/PO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO 10	PO 11	PO 12	PSO 1	PSO2	PSO3	PSO4
CO1	2	3	_	2	_	_	_	1	2	1	_	1	1	1	1	1
CO2	2	3		2				1	2	1						
CO3	2	3		2				1	2	1				2		
CO4	2	3		2				1	2	1		1	2	1		
CO5	2	3		2				1	2	1		1	2	2	2	2
CO6	2	2		2				1	2	1		1			2	1
1 - Low								**2** –Medium						**3** - High		

PART A: ELECTRICAL ENGINEERING LAB

List of experiments:

1. Verification of KCL and KVL
2. Verification of Superposition theorem
3. Measurement of Resistance using Wheat stone bridge
4. Magnetization Characteristics of DC shunt Generator
5. Measurement of Power and Power factor using Single-phase wattmeter
6. Measurement of Earth Resistance using Megger
7. Calculation of Electrical Energy for Domestic Premises

PART B: ELECTRONICS ENGINEERING LAB

List of Experiments:

1. Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.
2. Plot V I characteristics of Zener Diode and its application as voltage Regulator.
3. Implementation of half wave and full wave rectifiers
4. Plot Input & Output characteristics of BJT in CE and CB configurations
5. Frequency response of CE amplifier.
6. Simulation of RC coupled amplifier with the design supplied
7. Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs.
8. Verification of Truth Tables of S-R, J-K& D flip flops using respective ICs.

Part - B
COURSE DELIVERY PLAN (LESSON PLAN):
<u>SECTION-D SCHEDULE</u>

DAY : TUESDAY
Batches: 24761A05K5 & 25761A05I8 to 25761A05L8
Faculty: Dr.M.Umavani & P.Rathnakar Kumar

H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week
Tentative date	03/02	10/02	17/02	24/02	10/03	17/03	31/03	07/04	21/04	28/04	05/05	12/05	02/06	09/06
Actual date														
24761A05K5 25761A05I8 To 25761A05L8	Demo & 1	2	3	4	5,6	REVISION OF EXPERIMENTS	INTERNAL EXAM-I	7	8	9	10	11,12	REVISION OF EXPERIMENTS	INTERNAL EXAM-II
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		

<u>PART-C</u>

EVALUATION PROCESS (R20 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	50

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

DAY : TUESDAY
Batches: 25761A05L9 to 25761A05P0
Faculty: K.Nagalinga Chary & A.V Ravi Kumar

H.T. Nos	I Week	II Week	III Week	IV Week	V Week	VI Week	VII Week	VIII Week	IX Week	X Week	XI Week	XII Week	XIII Week	XIV Week
Tentative date	03/02	10/02	17/02	24/02	10/03	17/03	31/03	07/04	21/04	28/04	05/05	12/05	02/06	09/06
Actual date														
25761A05L9 To 25761A05P0	Demo & 1	2	3	4	5,6	REVISION OF EXPERIMENTS	INTERNAL EXAM-I	7	8	9	10	11,12	REVISION OF EXPERIMENTS	INTERNAL EXAM-II
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		
	Demo & 1	2	3	4	5,6			7	8	9	10	11,12		

PART-C
EVALUATION PROCESS (R20 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	50

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.

Dr.M.Umavani K.Nagalinga Chary A.V.Ravi Kumar P.Rathnakar kumar	**Dr.AVGA Marthanda**	**Dr.G.Nageswara Rao**	**Dr.P.Sobha Rani**
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

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

ACADEMIC YEAR : 2025-26

COURSE NAME & CODE : Engineering Workshop, 23ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Dr.K.Dilip Kumar, Professor
Mr. K. Sai Babu, Asst. Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	LabManual

COURSE DELIVERY PLAN (LESSON PLAN): Section-D

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Demonstration	3	04-02-2026		TLM8	-	
2.	Experiment-1	3	11-02-2026		TLM8	R1	
3.	Experiment-2	3	18-02-2026		TLM8	R1	
4.	Experiment-3	3	25-02-2026		TLM8	R1	
5.	Experiment-4	3	04-03-2026		TLM8	R1	
6.	Experiment-5	3	11-03-2026		TLM8	R1	
7.	Experiment-6	3	18-03-2026		TLM8	R1	
I-Mid Examinations (23.03.2026 to 28.03.2026)							
8.	Experiment-7	3	01-04-2026		TLM8	R1	
9.	Experiment-8	3	08-04-2026		TLM8	R1	
10.	Experiment-9	3	15-04-2026		TLM8	R1	
11.	Experiment-10	3	22-04-2026		TLM8	R1	
12.	Additional Experiments	3	29-04-2026		TLM8	R1	
13.	Repetition lab	3	06-05-2026		TLM8	R1	
14.	Lab Internal	3	13-05-2026		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	02-02-2026	21-03-2026	7W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	7W
II Phase of Instructions	01-06-2026	13-06-2026	2W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practical's	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	2W

Part-C

EVALUATION PROCESS:

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

Details of Batches: D-SEC

Batch No.	Reg.No.of Students	Number of Students	Batch No.	Reg.No.of Students	Number of Students
B1	24761A05K5,25761 A05I8-5J9	13	B1	24761A05K5,25761 A05I8-5J9	13
B2	25761A05K0-5L2	13	B2	25761A05K0-5L2	13
B3	25761A05L3-5M5	13	B3	25761A05L3-5M5	13
B4	25761A05M6-5N8	13	B4	25761A05M6-5N8	13
B5	25761A05N9-5P0	12	B5	25761A05N9-5P0	12

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09	Exp. 10
B1	C1	C2	F1	F2	P1	P2	E1	E2	T1	T2
B2	C2	C1	F2	F1	P2	P1	E2	E1	T2	T1
B3	F1	F2	P1	P2	E1	E2	T1	T2	C1	C2
B4	F2	F1	P2	P1	E2	E1	T2	T1	C2	C1
B5	P1	P2	E1	E2	T1	T2	C1	C2	F1	F2
B1	P2	P1	E2	E1	T2	T1	C2	C1	F2	F1
B2	E1	E2	T1	T2	C1	C2	F1	F2	P1	P2
B3	E2	E1	T2	T1	C2	C1	F2	F1	P2	P1
B4	T1	T2	C1	C2	F1	F2	P1	P2	E1	E2
B5	T2	T1	C2	C1	F2	F1	P2	P1	E2	E1

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

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

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

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. M.Kiran Kumar
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/D **A.Y.:** 2025-26

PREREQUISITE: PPSC

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Array Manipulations	3	02-02-2026		
2.	Searching and Sorting Techniques	3	09-02-2026		
3.	Single Linked List	3	16-02-2026		
4.	Double Linked List	3	23-02-2026		
5.	Circular Linked List	3	02-03-2026		
6.	Polynomial Representation & Polynomial Addition	3	09-03-2026		
7.	Linked List Applications	3	16-03-2026		
8.	Stack Implementation	3	06-04-2026		
9.	Stack Applications	3	13-04-2026		
10.	Queue Implementation & Circular Queue	3	20-04-2026		
11.	Double Ended Queue	3	04-05-2026		
12.	Trees	3	11-05-2026		
13.	Hashing	3	01-06-2026		
14.	Internal Exam	3	08-06-2026		

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	Mr.M.Kiran Kumar	Dr. Y.V.B Reddy	Dr. Y.V.B Reddy	Dr.S.Nagarjuna Reddy
Signature				

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

DEPARTMENT OF ECE

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr P.Rakesh Kumar **Date**: 02-02-2026

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

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

Program/Sem./Sec. : B.Tech/II/CSE-F **A.Y.:** 2025-26

Regulations: R23

PREREQUISITE: Physics

Course Objectives (COs)

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

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

Course Outcomes (COs): At the end of the course, student will be able to

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

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

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

TEXTBOOKS:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

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

REFERENCE BOOKS:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC ELECTRICAL ENGINEERING

UNIT-I: DC & AC Circuits

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and Course Outcomes	1	02-02-2026		TLM1	
2.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	04-02-2026		TLM1	
3.	Ohm's Law and its limitations, KCL & KVL **HUMAN KCL & KVL ROLE-PLAY-ITM**	1	06-02-2026		TLM1	
4.	Series, Parallel, series-parallel circuits	1	07-02-2026		TLM1	
5.	Superposition theorem	1	9-02-2026		TLM1	
6.	**AC Circuits:** A.C. Fundamentals:	1	11-02-2026		TLM1	
7.	Equation of AC Voltage and current, waveform	1	13-02-2026		TLM1	
8.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	14-02-2026		TLM1	
9.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	16-02-2026		TLM1	
10.	Concept of Impedance, Active power, reactive power and apparent power	1	18-02-2026		TLM2	
11.	Concept of power factor (Simple Numerical problems).	1	20-02-2026		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Machines and Measuring Instruments

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	**Machines:** Construction, principle and operation of DC Motor	1	21-02-2026		TLM1	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Construction, principle and operation of DC Generator	1	23-02-2026		TLM2	
14.	Construction, principle and operation of Single-Phase Transformer	1	25-02-2026		TLM2	
15.	Construction, principle and operation of Three Phase Induction Motor	1	27-02-2026		TLM2	
16.	Construction, principle and operation of Alternator, Applications of electrical machines	1	28-02-2026		TLM1	
17.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	02-03-2026		TLM2	
18.	Moving Iron (MI) Instruments, Wheatstone Bridge	1	04-03-2026		TLM2	
No. of classes required to complete UNIT-II: 07				**No. of classes taken:**		

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

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	**Energy Resources**: Conventional and non-conventional energy resources	1	06-03-2026		TLM1	
20.	Layout and operation of various Power Generation systems: Hydel power generation	1	07-03-2026		TLM1	
21.	Layout and operation of nuclear power generation	1	09-03-2026		TLM1	
22.	Layout and operation of Solar power generation	1	11-03-2026		TLM1	
23.	**Electricity bill:** Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc. **Electricity Bill as a Story Problem-ITM**	1	13-03-2026		TLM1	
24.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers	1	16-03-2026		TLM1	
25.	**Equipment Safety Measures:** Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits.	1	18-03-2026		TLM1	
26.	**Personal Safety Measures**: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-III: 08				**No. of classes taken:**		

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

PART B: BASIC ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

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

		Required	Completion	Completion	Methods	Weekly
27.	Introduction to Course and Course Outcomes	1	30-03-2026		TLM1	
28.	Evolution of electronics, Vacuum tubes to nano electronics	1	01-04-2026		TLM1	
29.	Characteristics of PN Junction Diode, **Role-Play Pedagogy**: "Inside the PN Junction"-ITM	1	04-04-2026		TLM1	
30.	Zener Effect — Zener Diode and its Characteristics	1	06-04-2026		TLM1	
31.	Bipolar Junction Transistor	1	08-04-2026		TLM1	
32.	Bipolar Junction Transistor	1	10-04-2026		TLM1	
33.	CB Configurations and Characteristics	1	13-04-2026		TLM2	
34.	CE Configurations and Characteristics.	1	15-04-2026		TLM2	
35.	CC Configurations and Characteristics.	1	17-04-2026		TLM2	
36.	Elementary Treatment of Small Signal CE Amplifier.	1	18-04-2026		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	20-04-2026		TLM1	
38.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	22-04-2026		TLM1	
39.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	24-04-2026		TLM1	
40.	**Amplifiers**: Block diagram of Public Address system	1	25-04-2026		TLM1	
41.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. **QUIZ** -ITM	1	27-04-2026		TLM2	
42.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	29-04-2026		TLM1	
43.	**Electronic Instrumentation:** Block diagram of an electronic instrumentation system.	1	01-05-2026		TLM2	
44.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	02-05-2026		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Digital Electronics

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

45.	Overview of Number Systems	3	04-05-2026 06-05-2026 08-05-2026		TLM1	
46.	Logic gates including Universal Gates	1	08-05-2026		TLM2	
47.	BCD codes, **Logic Gates as Decision Machines**-ITM	1	11-05-2026		TLM1	
48.	Excess-3 code, gray code	1	13-05-2026		TLM2	
49.	Hamming code	1	15-05-2026		TLM1	
50.	Boolean Algebra	1	16-05-2026		TLM1	
51.	Basic Theorems and properties of Boolean Algebra	1	01-06-2026		TLM1	
52.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	03-06-2026		TLM1	
53.	Simple combinational circuits	1	05-06-2026		TLM2	
54.	Half and Full Adders	1	06-06-2026		TLM1	
55.	Introduction to sequential circuits, Flip flops	2	08-06-2026 10-06-2026		TLM2	
56.	Registers	1	12-06-2026		TLM2	
57.	Counters	1	13-06-2026		TLM2	
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

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

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

Description	**From**	**To**	**Weeks**
I Phase of Instructions	02-02-2026	21-03-2026	8W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	8W
Summer Vacation	18-05-2026	30-05-2026	2W
II Phase of Instructions	01-06-2026	13-06-2026	2W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practicals	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	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.

Date: 02-02-2026

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Dr. P. Rakesh Kumar	Dr. AVGA Marthanda	Dr. G. Nageswara Rao	Dr. G. Srinivasulu

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Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
L.B. Reddy Nagar, Mylavaram, NTR Dist., Andhra Pradesh-521 230.
Phone: 08659-222933, **Fax**: 08659-222931
FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

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

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	04-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	06-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	09-02-2026		TLM1	CO1	T1,T2	
7.	Non-exact DE Type I	1	10-02-2026		TLM1	CO1	T1,T2	
8.	TUTORIAL - I	1	11-02-2026		TLM3	CO1	T1,T2	
9.	Non-exact DE Type II	1	13-02-2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	14-02-2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	16-02-2026		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	17-02-2026		TLM1	CO1	T1,T2	
13.	TUTORIAL - II	1	18-02-2026		TLM3	CO1	T1,T2	
14.	Law of natural growth and decay	1	20-02-2026		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	21-02-2026		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	23-02-2026		TLM1	CO1	T1,T2	
17.	TUTORIAL - III	1	24-02-2026		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	25-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	27-02-2026		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	28-02-2026		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	02-03-2026		TLM1	CO1	T1,T2	
22.	TUTORIAL - IV	1	04-03-2026		TLM3	CO1	T1,T2	
23.	P.I for Cos bx, or sin bx	1	06-03-2026		TLM1	CO1	T1,T2	
24.	P.I for $e^{ax+b}v(x)$	1	07-03-2026		TLM1	CO1	T1,T2	

25.	P.I for $x^k v(x)$	1	09-03-2026		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	10-03-2026		TLM1	CO1	T1,T2	
27.	TUTORIAL - V	1	11-03-2026		TLM3	CO1	T1,T2	
28.	Simultaneous linear equations	1	13-03-2026		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	14-03-2026		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	16-03-2026		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	17-03-2026		TLM1	CO1	T1,T2	
32.	TUTORIAL - VI	1	18-03-2026		TLM3	CO1	T1,T2	
33.	Revision	1	20-03-2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	30-04-2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	31-04-2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	01-04-2026		TLM1	CO2	T1,T2	
37.	TUTORIAL - VII	1	04-04-2026		TLM3	CO2	T1,T2	
38.	Solving of PDE	1	06-04-2026		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	07-04-2026		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	08-04-2026		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	10-04-2026		TLM1	CO2	T1,T2	
42.	TUTORIAL - VIII	1	11-04-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	Introduction to UNIT IV	1	13-04-2026		TLM1	CO3	T1,T2	
44.	Vector Differentiation	1	15-04-2026		TLM1	CO3	T1,T2	
45.	Gradient	1	17-04-2026		TLM1	CO3	T1,T2	
46.	Directional Derivative	1	18-04-2026		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	20-04-2026		TLM1	CO3	T1,T2	
48.	Divergence	1	21-04-2026		TLM1	CO3	T1,T2	

49.	TUTORIAL - IX	1	22-04-2026		TLM3	CO3	T1,T2	
50.	Curl	1	24-04-2026		TLM1	CO3	T1,T2	
51.	Problems	1	25-04-2026		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	27-04-2026		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	28-04-2026		TLM1	CO3	T1,T2	
54.	Vector Identities	1	29-04-2026		TLM1	CO3	T1,T2	
55.	Vector Identities	1	01-05-2026		TLM1	CO3	T1,T2	
56.	TUTORIAL X	1	02-05-2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57	Introduction to Unit-V	1	04-05-2026		TLM1	CO4	T1,T2	
58	Line Integral	1	05-05-2026		TLM1	CO4	T1,T2	
59	Circulation	1	06-05-2026		TLM1	CO4	T1,T2	
60	Work done	1	08-05-2026		TLM1	CO4	T1,T2	
61	Surface Integral	1	09-05-2026		TLM1	CO4	T1,T2	
62	Surface Integral	1	11-05-2026		TLM1	CO4	T1,T2	
63	Flux	1	12-05-2026		TLM1	CO4	T1,T2	
64	TUTORIAL XI	1	13-05-2026		TLM3	CO4	T1,T2	
65	Green's Theorem	1	15-05-2026		TLM1	CO4	T1,T2	
66	Stoke's Thoerem	3	16-05-2026 01-06-2026 02-06-2026		TLM1	CO4	T1,T2	
67	Divergence Theorem	3	03-06-2026 05-06-2026 06-06-2026		TLM1	CO4	T1,T2	
68	TUTORIAL XII	2	08-06-2026 09-06-2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		17			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	3	10-06-2026 12-06-2026 13-06-2026		TLM2	CO2	T1,T2	
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. GOVINDU
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/F **A.Y.:** 2025-26

PREREQUISITE: PPSC

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

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

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

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Array Manipulations	3	05-02-2026		
2.	Searching and Sorting Techniques	3	12-02-2026		
3.	Single Linked List	3	19-02-2026		
4.	Double Linked List	3	26-02-2026		
5.	Circular Linked List	3	05-03-2026		
6.	Polynomial Representation & Polynomial Addition	3	12-03-2026		
7.	Linked List Applications	3	02-04-2026		
8.	Stack Implementation	3	09-04-2026		
9.	Stack Applications	3	16-04-2026		
10.	Queue Implementation & Circular Queue	3	23-04-2026		
11.	Double Ended Queue	3	30-04-2026		
12.	Trees	3	07-05-2026		
13.	Hashing	3	08-05-2026		
14.	Internal Exam	3	11-06-2026		

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. S. GOVINDU
Course Name & Code **:** DATA STRUCTURES & 23CS02
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /F **A.Y.:** 2025-26

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	02-02-2026		TLM1	
2.	Definition and Importance of Linear Data Structures	1	03-02-2026		TLM1	
3.	Abstract Data Types and Implementation	1	04-02-2026		TLM1	
4.	Overview of time and space complexity	1	06-02-2026		TLM1	
5.	Analysis of Liner Data structures	2	09-02-2026 10-02-2026		TLM1	
6.	Revise Arrays	1	11-02-2026		TLM1	
7.	Searching Techniques: Linear Search	1	13-02-2026		TLM1	
8.	Binary Search & Analysis	2	16-02-2026 17-02-2026		TLM1	
9.	Bubble Sort & Analysis	1	18-02-2026		TLM1	
10.	Insertion Sort & Analysis	2	20-02-2026 23-02-2026		TLM1	
11.	Selection Sort & Analysis	2	24-02-2026 25-02-2026		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	27-02-2026		TLM1	
13.	Linked List Representation	1	02-03-2026		TLM1	
14.	Sing Linked List : Operations	2	04-03-2026 06-03-2026		TLM1	
15.	Double Linked List : Operations	2	09-03-2026 10-03-2026		TLM1	
16.	Circular Single Linked List	1	11-03-2026		TLM1	
17.	Circular Double Linked List	2	13-03-2026 16-03-2026		TLM1	
18.	Comparing Arrays and Linked List	1	17-03-2026		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	18-03-2026		TLM1	
20.	Polynomial Addition	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	30-03-2026		TLM1	
22.	Operations of Stacks	1	31-03-2026		TLM1	

23.	Implementation of stacks using arrays	1	01-04-2026		TLM1	
24.	Stacks using Linked List	1	06-04-2026		TLM1	
25.	Expressions: Expression evaluation	2	07-04-2026 08-04-2026		TLM1	
26.	Infix to Postfix Conversion	2	10-04-2026 13-04-2026		TLM1	
27.	Checking Balanced Parenthesis	2	15-04-2026 17-04-2026		TLM1	
28.	Reversing a List	1	20-04-2026		TLM1	
29.	Backtracking	1	21-04-2026		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	22-04-2026		TLM1	
31.	Implementing queues using arrays	1	24-04-2026		TLM1	
32.	Implementing queues using Linked List	1	27-04-2026		TLM1	
33.	Applications of Queue: Scheduling	1	28-04-2026		TLM1	
34.	Breadth First Search	1	29-04-2024		TLM1	
35.	Circular Queue	1	01-05-2026		TLM1	
36.	Double ended queue	1	04-05-2026		TLM1	
37.	Applications of Deque	1	05-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	06-05-2026		TLM1	
39.	Representation of Trees	1	08-05-2026		TLM1	
40.	Tree Traversals	1	11-05-2026		TLM1	
41.	Binary Search Trees-Operations	2	12-05-2026 13-05-2026		TLM1	
42.	Hashing Introduction	1	15-05-2026		TLM1	
43.	Hash Functions	1	01-06-2026		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	02-06-2026		TLM1	
45.	Open Addressing: Linear Probing	1	03-06-2026		TLM1	
46.	Quadratic Probing, Double Hashing	1	05-06-2026		TLM1	
47.	Rehashing, Applications of Hashing	1	08-06-2026		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	3	09-06-2026 10-06-2026 12-06-2026					
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (02-06-2025 TO 07-06-2025)								

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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

DEPARTMENT OF ECE

LAB HANDOUT

PART-A

Date: 02-02-2026

Name of Course Instructor	: Dr. P. Rakesh Kumar, Ms.B.Lakshmi Thirapathama, Mr.M.Samba Siva Reddy, Dr.V.Ravi Sekhara Reddy		
Course Name & Code	: Electrical & Electronics Engineering Workshop (23EE51)		
L-T-P Structure	: 0-0-3	**Credits**	: 1.5
Program/Sem	**:** B.Tech., CSE-F., II Sem	**A.Y.**	: 2025-26

PREREQUISITE: NIL

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

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to EEE Workshop, Course outcomes	3	04-02-2026		TLM4	
2.	Verification of KCL and KVL	3	11-02-2026		TLM4	
3.	Verification of Superposition Theorem	3	18-02-2026		TLM4	
4.	Measurement of Resistance using Wheat stone bridge	3	25-02-2026		TLM4	
5.	Magnetization Characteristics of DC Shunt Generator	3	04-03-2026		TLM4	
6.	Measurement of Power and Power factor using Single-phase wattmeter	3	11-03-2026		TLM4	
7.	Calculation of Electrical Energy for Domestic Premises	3	18-03-2026		TLM4	
8.	Internal Lab Examination (**Electricals**)	3	01-04-2026		TLM4	
9.	Introduction to BEEE Lab (Function Generators, CRO, RPS, Breadboard etc), Course Objectives and Outcomes.	3	08-04-2026		TLM4	
10.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	15-04-2026		TLM4	
11.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.	3	22-04-2026		TLM4	
12.	Implementation of half wave and full wave rectifiers	3	29-04-2026		TLM4	
13.	Plot Input & Output characteristics of BJT in CB configuration-04	3	06-05-2026		TLM4	
14.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	13-05-2026		TLM4	
15.	Verification of truth Tables of SR and JK Flip flop	3	03-06-2026		TLM4	
16.	Internal Lab Examination (**Electronics**)	3	10-06-2026		TLM4	
No. of classes required: 48				**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.
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PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Date: 02-02-2026

Course Instructors	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Dr. P. Rakesh Kumar Ms.B.Lakshmi Thirapathama Mr.M.Samba Siva Reddy Dr.V.Ravi Sekhara Reddy	Dr. AVGA Marthanda	Dr. G.Nageswara Rao	Dr. G.Srinivasulu

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor(s): **Jonnala Subba Reddy (T668),**
Mr. V. Shankara Rao (T721), Mr. K. Sai Babu (T822)

Course Name & Code	**:** Engineering Graphics – 23ME01	**Regulations**	**:** R23
L-T-P Structure	**:** 2 – 0 - 4	**Credits**	**:** 03
Program /Sem /Sec	: B.Tech/ II SEM CSE - F Section	**A.Y.**	**:** 2025-26
PREREQUISITE	**:** Engineering Physics, Engineering 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. (**Understanding Level –L2**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Applying Level –L3**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Apply –L3**)
CO4	Able to draw the development of surfaces of simple objects. (**Applying Level –L3**)
CO5	Prepare isometric and orthographic sections of simple solids. (**Applying Level –L3**)

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

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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

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

UNIT - I: INTRODUCTION, GEOMETRICAL CONSTRUCTIONS, SCALES, CONICS, CYCLOIDS, INVOLUTES, ORTHOGRAPHIC PROJECTIONS OF POINTS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
01	Introduction to Engineering Graphics: COs, CEOs, POs and PEOs **UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, Principles of Engineering Graphics,and their Significance	2	02-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
02	Drawing Instruments and their use-Conventions in Drawing, Lines, Lettering, and Dimensioning – BIS Conventions, Practice	3	03-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
03	**Geometrical Constructions** and Constructing regular polygons by general methods, **Scales**: Plain scales, diagonal scales, and vernier scales	2	09-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
04	Engineering **Curves**: Conic Sections, Construction of Ellipse, Parabola, and Hyperbola by general method only	3	10-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
05	Construction of Cycloids, Involutes, Normal and Tangent to Curves, Practice	2	16-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
06	**Orthographic Projections**: Reference plane, importance of reference lines or Plane, Practice	3	17-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
07	Projections of a point situated in any one of the four quadrants, Practice	2	23-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
08	Projections of a point situated in any one of the four quadrants, Practice	3	24-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
No. of classes required to complete UNIT - I: 20 (Lecture: 08, Practice: 12)			**No. of classes taken (including Practice):**					

UNIT-II: PROJECTIONS OF STRAIGHT LINES AND PLANES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
09	**Projections of straight lines:** Projections of straight lines parallel to both reference planes, perpendicular to one reference plane, and parallel to other reference planes, Practice	2	02-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
10	Projections of lines inclined to one reference plane and parallel to the other reference plane, Practice	3	03-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
11	Projections of Straight Line Inclined to both the reference planes, Practice	2	09-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
12	**Projections of Planes:** Projections of Regular planes Perpendicular to both reference planes, parallel to one reference plane, and inclined to the other reference plane, Practice	3	10-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
13	Projections of planes inclined to both the reference planes, Practice	2	16-03-2026		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
14	Practice	3	17-03-2026		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
-	**I Mid Examinations: From 23-03-2026 to 28-03-2026 (Covered CO 1 & CO 2)**							
No. of classes required to complete UNIT - II: 20 (Lectures: 06, Practice: 09)			**No. of classes taken (including Practice):**					

UNIT-III: PROJECTIONS OF SOLIDS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
15	Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to HP, Practice	2	30-03-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
16	Projections of solids in simple positions: Axis perpendicular to vertical plane and Axis parallel to both the reference planes	3	31-03-2026		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
17	Projection of Solids with axis inclined to one reference plane and parallel to another plane, Practice	2	06-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
18	Numericals	3	07-04-2026		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
19	Practice	2	13-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
20	Practice	3	14-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
No. of classes required to complete UNIT - III: 15 (Lecture: 06, Practice: 09)			**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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
21	Introduction to Sections of Solids and Development of Surfaces: Perpendicular and inclined section planes	2	20-04-2026		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
22	Sectional views and True shape of section, Practice	3	21-04-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
23	Sections of solids in simple position only, Numericals	2	27-04-2026		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
24	**Development of Surfaces:** Introduction to Methods of Development of Surfaces, Parallel Line Development (Plane Surfaces), Practice	3	28-04-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
25	Radial Line Development, Numericals	2	04-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
26	Practice	3	05-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
No. of classes required to complete UNIT - IV: 20 (Lecture: 06, Practice: 14)			**No. of classes taken (including Practice):**					

UNIT-V: CONVERSION VIEWS & COMPUTER GRAPHICS:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
27	Introduction to Isometric Views, Isometric Views of Planes, Solids	2	11-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
28	Conversion of isometric views to orthographic views , Practice	3	12-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
29	Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views	2	01-06-2026		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
30	Practice	3	02-06-2026		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
31	**Computer Graphics**: Creating 2D&3D drawings of objects, including PCB and Transformations using Auto CAD	2	08-06-2026		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
32	Practice	3	09-06-2026		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
No. of classes required to complete UNIT - V: 10 (Lecture: 04, Practice: 06)			**No. of classes taken (including Practice):**					
Summer Vacation: 18-05-20026 to 30-05-2026; II Mid Examinations: From 15-06-20026 to 20-06-2026 (Covered CO 3, CO 4 & CO 5)								

Teaching Learning Methods:

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

PART-C

EVALUATION PROCESS for EG Course (R23 Regulation):

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

ACADEMIC CALENDAR - B.Tech - II Semester (R23):

Commencement of Class work		**02-02-2026**	
Description	**From**	**To**	**Weeks**
I Phase of Instructions	02-02-2026	21-03-2026	7 Weeks
I Mid Examinations	23-03-2026	28-03-2026	1 Week
II Phase of Instructions	30-03-2026	16-05-2026	7 Weeks
Summer Vacation	18-05-2026	30-05-2026	2 Weeks
II Phase of Instructions (Contd..)	01-06-2026	13-06-2026	2 Weeks
II Mid Examinations	15-06-2026	20-06-2026	1 Week
Preparation and Practicals	22-06-2026	27-06-2026	1 Week
Semester End Examinations	29-06-2026	11-07-2026	2 Weeks
Commencement of Next (II) Semester Class Work		**13-07-2026**	

Class Time Table - B.Tech – I Sem: MECH A - Section (R23)

↓Day / Date→	**09.00 – 10.00**	**10.00 – 11.00**	**11.00 – 12.00**	**12.00 – 13.00**	**13.00 – 14.00**	**14.00 – 15.00**	**15.00 – 16.00**
Monday		**Engineering Graphics (CSE – F)**		**LUNCH BREAK**			
Tuesday					**Engineering Graphics (CSE – F)**		
Wednesday							
Thursday							
Friday							
Saturday							

Day – to – Day work / Submission of Sheets

S.No	Unit No	Course Outcome	Sheet No. and Content
1	**I**	**CO 1**	1. Geometrical Constructions, Engineering Curves: Ellipse, Parabola, Hyperbola 2. Construction of Cycloids, involutes 3. Projections of Points
2	**II**	**CO 2**	4. Projections of straight lines 5. Projections of Planes
3	**III**	**CO 3**	6. Projections of Solids
4	**IV**	**CO 4**	7. Sections of Solids 8. Development of Surfaces
5	**V**	**CO 5**	9. Isometric views of simple solids, conversion of Isometric views to Orthographic Projections 10. Conversion of Orthographic Projections to Isometric Views

PART-D

Program Educational Objectives (PEOs):

PEO1: Pursue higher education, entrepreneurship and research to compete at global level.

PEO2: Design and develop products innovatively in the area of computer science and engineering and in other allied fields.

PEO3: Function effectively as individuals and as members of a team in the conduct of interdisciplinary projects; and even at all the levels with ethics and necessary attitude.

PEO4: Serve ever-changing needs of the society with a pragmatic perception.

Program Outcomes (POs):

PO1 - Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - Design / Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 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 Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project Management and Finance: Demonstrate knowledge and understanding of the ring 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.

Program Specific Outcomes (PSOs):

PSO1: The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

PSO2: The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

PSO3: To inculcate an ability to analyze, design and implement database applications.

Signature				
Name of the Faculty	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. S. Nagarjuna Reddy
Designation / Title	Associate Professor / Course Instructor	Associate Professor / Course Coordinator	Associate Professor/ Module Coordinator	Professor / Head of the Department

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

Part-A

PROGRAM	:	**B.Tech.,II-Sem.,CSE-F**
ACADEMICYEAR	:	**2025-26**
COURSENAME &CODE	:	**ENGINEERING PHYSICS LAB**
L-T-PSTRUCTURE	:	**0 – 0 – 3**
COURSECREDITS	:	**1**
COURSEINSTRUCTOR	:	**Dr. P.Sobhanachalam / Dr. S. Yusub**
COURSECOORDINATOR	:	

Pre-requisites : **Nil**

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

Course Outcomes:

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

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

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

List of Experiments

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

References:

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

BOSAPPROVEDTEXTBOOKS:

1. LabManualPreparedbytheLBRCE.

EVALUATIONPROCESS:

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

Part-B

COURSEDELIVERYPLAN (LESSONPLAN): CSE-F

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
1.	Introduction & Demonstration	3	6.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
2.	Experiment1	3	13.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
3.	Experiment2	3	20.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
4.	Experiment3	3	27.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
5.	Experiment 3	3	6.3.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
6.	Experiment 4	3	13.3.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
7.	Experiment5	3	20.3.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
8.	**MID-1 Exam**	3	27.3.26		**---**	---	---	
9.	Experiment 6	3	10.4.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
10.	Experiment 7	3	17.4.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
11.	Experiment8	3	24.4.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
12.	Experiment 8	3	1.5.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
13.	Experiment 9	3	8.5.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
14.	Experiment 10	3	15.5.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
15.	**Internal Exam**	3	5.6.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
16.	**Internal Exam**	3	12.6.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
17.	**MID-2 Exam**	3	19.6.26		**---**	---	---	

No.of classes required to completed	16	No.of classes taken:

PROGRAM OUT COMES: Engineering Graduates will be able to:

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

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

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

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

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

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

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

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

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

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

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

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

Course Instructor	Course Coordinator	Module Coordinator	H.O.D
Dr. P. Sobhanachalam /Dr.S. Yusuf	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.T. Satyanarayana**

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**:I B.Tech.,II-Sem.,CSE-F**
ACADEMICYEAR	**:2025-26**
COURSENAME &CODE	**: ENGINEERING PHYSICS**
L-T-PSTRUCTURE	**:4-0-0**
COURSECREDITS	**3**
COURSEINSTRUCTOR	**:Dr. P. Sobhanachalam**
PRE-REQUISITE	**:Basic Knowledge of Physics**

Course Objectives:

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

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

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

COURSEARTICULATIONMATRIX(Correlation between COs, Pos & PSOs):

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

TEXT BOOKS

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

REFERENCES

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

WEBRESOURCES

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

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

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE,DIFFRACTION& POLARIZATION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	2.2.26		**TLM-2**		
2.	Principle of superposition, Interference of light	1	5.2.26		**TLM-3**		
3.	Interference in thin films by reflection & applications	1	5.2.26		**TLM-2**		
4.	Colors in thin films, Newton's rings	1	7.2.26		**TLM-1**		
5.	Determination of wavelength and refractive index	1	9.2.26		**TLM-4**		
6.	Problems& Assignment/Quiz	1	12.2.26		**TLM-1**		
7.	Introduction, Fresnel and	1	12.2.26		**TLM-3**		

	Fraunhoffer diffractions						
8.	Fraunhoffer diffraction due to single slit	1	14.2.26		**TLM-2**		
9.	Double slit& N slits(Qualitative)	1	16.2.26		**TLM-4**		
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	19.2.26		**TLM-4**		
11.	Problems& Assignment/Quiz	1	19.2.26		**TLM-3**		
12.	Introduction – Types of polarization	1	21.2.26		**TLM-2**		
13.	Polarization by reflection, refraction & double refraction	1	23.2.26		**TLM-2**		
14.	Nicol's prism	1	26.2.26		**TLM-5**		
15.	Half wave and Quarter wave plates	1	26.2.26		**TLM-2**		
16.	Problems& Assignment/Quiz	1	28.2.26		**TLM-3**		
No.of classes required to complete UNIT-I:16				No.of classes taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	2.3.26		**TLM-3**		
2.	Bravais Lattices	1	5.3.26		**TLM-2**		
3.	Crystal Systems(3D)	1	5.3.26		**TLM-2**		
4.	Coordination number – Packing fraction of –SC, BCC	1	7.3.26		**TLM-1**		
5.	Coordination number – Packing fraction of FCC	1	9.3.26		**TLM-1**		
6.	Miller indices& Properties	1	12.3.26		**TLM-2**		
7.	Separation between successive (hkl) planes, Bragg's	1	12.3.26		**TLM-1**		

	law; X–ray Diffractometer						
8.	Crystal Structure determination by Laue's method	1	14.3.26		**TLM-3**		
9.	Crystal Structure determination by Powder method	1	16.3.26		**TLM-2**		
10.	MID-1 Examinations	1	23.3.26		**----**		
11.	MID-1 Examinations	1	28.3.26		**----**		
No.of classes required to complete UNIT-II: 11				No.of classes taken:			

UNIT-III :DIELECTRIC & MAGNETIC MATERIALS

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

S.No	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dielectric polarization Dielectric polarizability, Susceptibility	1	30.3.26		**TLM-2**		
2.	Dielectric constant & Displacement Vector, Relation between the electric vectors	1	2.4.26		**TLM-3**		
3.	Types of polarizations-Electronic polarization	1	2.4.26		**TLM-1**		
4.	Types of polarizations- ionic & orientation polarizations (Qualitative)	1	4.4.26		**TLM-1**		
5.	Lorentz internal field	1	6.4.26		**TLM-2**		
6.	Claussius-Mosotti equation, Complex dielectric constant	1	9.4.26		**TLM-1**		
7.	Frequency dependence of polarization dielectric loss	1	9.4.26		**TLM-5**		
8.	Problems& Assignment/Quiz	1	11.4.26		**TLM-3**		
9.	Introduction Magnetic dipole moment, Magnetization Magnetic susceptibility &	1	13.4.26		**TLM-4**		

	permeability						
10.	Atomic origin of magnetism	1	16.4.26		**TLM-1**		
11.	Classification of magnetic materials-Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	16.4.26		**TLM-2**		
12.	Domain concept for Ferromagnetism & Domain walls	1	18.4.26		**TLM-2**		
13.	Hysteresis	1	20.4.26		**TLM-5**		
14.	soft and hard magnetic materials	1	23.4.26		**TLM-1**		
15.	Problems& Assignment/Quiz	1	23.4.26		**TLM-3**		
No.of classes required to complete UNIT-III:15				No.of classes taken:			

UNIT-IV :QUANTUM MECHANICS&FREEELECTRONTHEORY

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter,De-Broglie's Hypothesis	1	25.4.26		**TLM-2**		
2.	Heisenberg's Uncertainty Principle	1	27.4.26		**TLM-2**		
3.	Significance & properties of wave function	1	30.4.26		**TLM-2**		
4.	Schrodinger's time independent and dependent wave equations	1	30.4.26		**TLM-1**		
5.	Particle in a one – dimensional infinite potential well	1	2.5.26		**TLM-1**		
6.	Problems& Assignment/Quiz	1	4.5.26		**TLM-3**		
7.	Classical free electron theory-merits and demerits, Quantum free electron theory	1	7.5.26		**TLM-2**		
8.	Electrical conductivity based on quantum free electron theory	1	7.5.26		**TLM-1**		
9.	Fermi -Dirac distribution and temperature dependence	1	9.5.26		**TLM-5**		
10.	Density of states,	1	11.5.26		**TLM-1**		

	Fermi energy						
11.	Problems& Assignment/Quiz	1	14.5.26		**TLM-3**		
No.of classes required to complete UNIT-IV:11				No.of classes taken:			

UNIT-V:SEMICONDUCTORPHYSICS

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Formation of energy bands, Classification of crystalline solids	1	14.5.26		**TLM-6**		
2.	Intrinsic semiconductors, Density of charge carriers	1	16.5.26		**TLM-1**		
3.	Electrical conductivity, Fermi level	1	1.6.26		**TLM-2**		
4.	Extrinsic semiconductors, Density of charge carriers	1	4.6.26		**TLM-1**		
5.	Dependence of Fermi energy on carrier concentration &temperature	1	4.6.26		**TLM-2**		
6.	Drift and Diffusion Currents, Einstein's equation	1	6.6.26		**TLM-1**		
7.	Hall Effect & its applications	1	8.6.26		**TLM-4**		
8.	Problems& Assignment/Quiz	1	11.6.26		**TLM-3**		
9.	Problems& Assignment/Quiz	1	11.6.26		**TLM-3**		
10.	Problems& Assignment/Quiz	1	13.6.26		**TLM-3**		
11.	MID-2 Examinations	1	15.6.26		**----**		
12.	MID-2 Examinations	1	18.6.26		**----**		
13.	MID-2 Examinations	1	18.6.26		**----**		
14.	MID-2 Examinations	1	20..6.26		**----**		
No.of classes required to complete UNIT-V:14				No.of classes taken:			

PART-C

EVALUATION PROCESS(R-23Regulation)

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

PART-D

PROGRAMMEOUTCOMES(POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering-fundamentals,andanengineeringspecializationtothesolutionofcomplex engineeringproblems.
PO 2	**Problem analysis**:Identify,formulate,review research literature,and analyze complexengineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics,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 needswithappropriateconsiderationforthepublichealthandsafety,and the cultural, societal,and environmental considerations.
PO 4	**Conductinvestigationsofcomplexproblems**:Useresearch-basedknowledgeand Research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Moderntoolusage**:Create,select,andapplyappropriatetechniques,resources,and modernengineeringandITtoolsincludingpredictionandmodelingtocomplexengineeringactivitieswithanunderstandingofthe 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	**Individualandteamwork**:Functioneffectivelyasanindividual,andasamember orleaderindiverseteams,andinmultidisciplinarysettings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large,such as,beingabletocomprehendandwriteeffectivereportsanddesigndocumentation,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**:Recognizetheneedforandhavethepreparationandabilityto engageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. P. Sobhanachalam	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.T Satyanarayana**

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** B. Tech., II-Sem., **CSE-G**
ACADEMIC YEAR	**:** 2025-2026
COURSE NAME & CODE	**:** Engineering Physics-23FE04
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**: Dr. S. YUSUB**
COURSE COORDINATOR	**: Dr. S. YUSUB**

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

Course Outcomes:

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

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

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

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

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

BoS APPROVED TEXT BOOKS:

TEXT BOOKS

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

REFERENCES

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): CSE-G

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	02-02-2026		TLM1	CO1	T1	
2.	Principle of superposition	1	04-02-2026		TLM1	CO1	T1	
3.	Interference of light, Interference in thin films by reflection reflection & applications	1	06-02-2026		TLM2	CO1	T1	
4.	colors in thin films	1	07-02-2026		TLM1	CO1	T1	
5.	Newton's rings	1	09-02-2026		TLM1	CO1	T1	
6.	ination of wavelength active index.	1	11-02-2026		TLM1	CO1	T1	
7.	DIFFRACTION: Introduction,	1	13-02-2026		TLM1	CO1	T1	
8.	Fresnel and Fraunhoffer diffractions	1	14-02-2026		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	16-02-2026		TLM1	CO1	T1	
10.	double slit & N slits (Qualitative)	1	18-02-2026		TLM1	CO1	T1	
11.	Diffraction Grating, Dispersive power	1	20-02-2026		TLM2	CO1	T1	
12.	Resolving power of Grating(Qualitative)	1	21-02-2026		TLM1	CO1	T1	
13.	Polarization : Introduction	1	23-02-2026		TLM1	CO1	T1	
14.	Types of polarization	1	25-02-2026		TLM1	CO1	T1	
15.	Polarization by reflection	1	27-02-2026		TLM1	CO1	T1	
16.	refraction & double refraction	1	28-02-2026		TLM2	CO1	T1	
17.	Nicol's prism	1	02-03-2026		TLM1	CO1	T1	
18.	half wave and quarter wave plates	1	04-03-2026		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	06-03-2026		TLM1	CO2	T1	
20	Lattice parameters, Bravais Lattices	1	07-03-2026		TLM2	CO2	T1	
21	Crystal Systems (3D)- Coordination number, Packing fraction of -SC	1	09-03-2026		TLM1	CO2	T1	
22	BCC, FCC	1	11-03-2026		TLM1	CO2	T1	
23	ndices, separation between ve (hkl) planes.	1	13-03-2026		TLM2	CO2	T1	
24	X–ray diffraction: Bragg's law; X–ray	1	14-03-2026		TLM1	CO2	T1	

	Diffractometer,							
25	Structure determination by vder methods.	1	16-03-2026		TLM1	CO2	T1	
26	Revision	1	18-03-2026		TLM2	CO1, CO2		
27	I MID	1.5	23-03-2026			CO1, CO2,		
28	I MID	1.5	24-03-2026			CO1, CO2,		
29	I MID	1.5	25-03-2026			CO1, CO2,		
30	I MID	1.5	26-03-2026			CO1, CO2,		
31	I MID	1.5	28-03-2026			CO1, CO2,		
No. of classes required to complete UNIT-II		16		No. of classes taken:				

UNIT – III : DIELECTRIC & MAGNETIC MATERIALS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
32.	DIELECTRIC MATERIALS: Introduction	1	01-04-2026		TLM1	CO3	T1	
33.	Dielectric polarization- Dielectric polarizability, Susceptibility, Dielectric constant & Displacement Vector	1	03-04-2026		TLM2	CO3	T1	
34.	Relation between the electric vectors	1	04-04-2026		TLM1	CO3	T1	
35.	Types of polarizations- Electronic (Quantitative), ionic (Quantitative) & orientation polarizations (Qualitative)	1	06-04-2026		TLM2	CO3	T1	

36.	Lorentz internal field	1	08-04-2026		TLM1	CO3	T1	
37.	Claussius-Mosotti equation	1	10-04-2026		TLM2	CO3	T1	
38.	ex dielectric constant – cy dependence of polariz tric loss.	1	11-04-2026		TLM1	CO3	T1	
39.	MAGNETIC MATERIALS : Introduction:	1	13-04-2026		TLM2	CO3	T1	
40.	Magnetic dipole moment – Magnetization- Magnetic susceptibility & permeability	1	15-04-2026		TLM2	CO3	T1	
41.	Atomic origin of magnetism	1	17-04-2026		TLM2	CO3	T1	
42.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	18-04-2026		TLM1	CO3	T1	
43.	Domain concept for Ferromagnetism & Domain walls	1	20-04-2026		TLM2	CO3	T1	
44.	Hysteresis – soft and hard magnetic materials	1	22-04-2026		TLM2	CO3	T1	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT – IV: QUANTUM MECHANICS & FREE ELECTRON THEORY

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
45.	QUANTUM MECHANICS: Dual nature of matter- Heisenberg's Uncertainty Principle	1	24-04-2026		TLM1	CO4	T1	
46.	significance & properties of wave function	1	25-04-2026		TLM2	CO4	T1	
47.	Schrodinger's time independent and dependent wave equations	1	27-04-2026		TLM2	CO4	T1	
48.	in a one –dimensional i	1	29-04-2026		TLM1	CO4	T1	

	l well.							
49.	FREE ELECTRON THEORY: Classical free electron theory (Qualitative with discussion of merits and demerits)	1	01-05-2026		TLM2	CO4	T1	
50.	Quantum free electron theory	1	02-05-2026		TLM1	CO4	T1	
51.	electrical conductivity based on quantum free electron theory	1	04-05-2026		TLM2	CO4	T1	
52.	Fermi -Dirac distribution	1	06-05-2026		TLM2	CO4	T1	
53.	Density of states – Fermi energy	1	08-05-2026		TLM1	CO4	T1	
	V: SEMI CONDUCTORS							
54.	SEMI CONDUCTORS: Formation of energy bands	1	09-05-2026		TLM2	CO5	T1	
55.	classification of crystalline solids- Intrinsic semiconductors	1	11-05-2026		TLM1	CO5	T1	
56.	Density of charge carriers- Electrical conductivity- Fermi level -Extrinsic semiconductors	1	13-05-2026		TLM1	CO5	T1	
57.	Density of charge carriers	1	15-05-2026		TLM1	CO5	T1	
58.	dependence of Fermi energy on carrier concentration and temperature	1	16-05-2026		TLM1	CO5	T1	
59.	**Summer Vacation 18-05-2026 to 30-05-2026**							
60.	Drift and Diffusion Currents	1	01-06-2026		TLM1	CO5	T1	

61.	Einstein's equation	1	03-06-2026		TLM2	CO5	T1	
62.	fect & its applications.	1	05-06-2026		TLM1	CO5	T1	
63.	Revision	1	06-06-2026		TLM1		T1	
64.	Revision	1	08-06-2026		TLM1		T1	
65.	Revision	1	10-06-2026		TLM1		T1	
66.	Revision	1	12-06-2026		TLM1		T1	
67.	Revision	1	13-06-2026		TLM1		T1	
No. of classes required to complete UNIT-V		12			No. of classes taken:			

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
68.	SEM	1	11-06-2026		TLM1		R1	
69.	Conventional energy sources	1	13-06-2026		TLM1		R1	
75	Mid II	1	15-06-2026			CO3, CO4, CO5		
76	Mid II	1	16-06-2026			CO3, CO4, CO5		
77	Mid II	1	17-06-2026			CO3, CO4, CO5		
78	Mid II	1	18-06-2026			CO3, CO4, CO5		
79	Mid II	1	19-06-2026			CO3, CO4, CO5		
80	Mid II	1	20-06-2026			CO3, CO4, CO5		
81	Preparation and Practicals	**22-06-2026 to 27-06-2026**						
82	Semester end examinations	**29-06-2026 to 11-07-2026**						

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)

TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

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)

The specific PEOs for the B.Tech Computer Science and Engineering program are:

- **PEO 1: Technical Proficiency and Adaptability:** To inculcate adaptability skills for software design, software development, or allied fields of computing, including research on recent trends.
- **PEO 2: Analytical Skills and Product Development:** To equip graduates with the ability to analyze, design, and synthesize data to create novel, sustainable products.
- **PEO 3: Ethical and Societal Responsibility:** To understand and analyze engineering issues within a broader perspective, with ethical responsibility towards sustainable development to meet societal needs.
- **PEO 4: Professionalism and Lifelong Learning:** To empower students with effective communication, technical documentation, teamwork, and leadership skills for a successful career.

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 Computer Science and Engineering program will have the ability to

1. The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

2. The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

3. To inculcate an ability to analyze, design and implement database applications.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Dr. S. YUSUB	Dr. S. YUSUB	Dr. S. YUSUB	Dr. T. SATYANARAYANA

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Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem., CSE G
ACADEMIC YEAR	**:** 2025-26
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. K.Jhansi Rani
PRE-REQUISITES	**:** Basics of Vectors**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

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

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	05-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	06-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	09-02-2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
8.	Non-exact DE Type I	1	13-02-2026		TLM1	CO1	T1,T2	
9.	Non-exact DE Type II	1	14-02-2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type III	1	16-02-2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type IV	1	17-02-2026		TLM1	CO1	T1,T2	
12.	Newton's Law of cooling	1	19-02-2026		TLM1	CO1	T1,T2	
13.	Newton's Law of cooling	1	20-02-2026		TLM1	CO1	T1,T2	
14.	Law of natural growth and decay	1	21-02-2026		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	23-02-2026		TLM1	CO1	T1,T2	
16.	Electrical circuits	1	24-02-2026		TLM1	CO1	T1,T2	
17.	TUTORIAL - I	1	26-02-2026		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	27-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	28-02-2026		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	02-03-2026		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	05-03-2026		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	06-03-2026		TLM1	CO1	T1,T2	
23.	P.I for polynomial function	1	07-03-2026		TLM1	CO1	T1,T2	

24.	P.I for $e^{ax+b}v(x)$	1	09-03-2026		TLM1	CO1	T1,T2	
25.	P.I for $x^k v(x)$	1	10-03-2026		TLM1	CO1	T1,T2	
26.	Method of Variation of parameters	1	12-03-2026		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	13-03-2026		TLM1	CO1	T1,T2	
28.	Simultaneous linear equations	1	14-03-2026		TLM1	CO1	T1,T2	
29.	Simultaneous linear equations	1	16-03-2026		TLM1	CO1	T1,T2	
30.	L-C-R circuits	1	17-03-2026		TLM1	CO1	T1,T2	
31.	Simple Harmonic motion	1	17-03-2026		TLM1	CO1	T1,T2	
32.	TUTORIAL - II	1	20-03-2026		TLM3	CO1	T1,T2	
33.	Revision	1	20-03-2026		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
34.	Introduction to Unit III	1	30-03-2026		TLM1	CO2	T1,T2	
35.	Formation of PDE by elimination of arbitrary constants	1	31-03-2026		TLM1	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	02-04-2026		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	04-04-2026		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	06-04-2026		TLM1	CO2	T1,T2	
39.	Lagrange's Method	1	07-04-2026		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	09-04-2026		TLM1	CO2	T1,T2	
41.	Homogeneous Linear PDE with constant coefficients	1	10-04-2026		TLM1	CO2	T1,T2	
42.	TUTORIAL - III	1	11-04-2026		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-III		09			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
43.	Introduction to UNIT IV	1	13-04-2026		TLM1	CO3	T1,T2	
44.	Vector Differentiation	1	16-04-2026		TLM1	CO3	T1,T2	

45.	Gradient	1	17-04-2026		TLM1	CO3	T1,T2	
46.	Directional Derivative	1	18-04-2026		TLM1	CO3	T1,T2	
47.	Directional Derivative	1	20-04-2026		TLM1	CO3	T1,T2	
48.	Divergence	1	21-04-2026		TLM1	CO3	T1,T2	
49.	Curl	1	23-04-2026		TLM1	CO3	T1,T2	
50.	Problems	1	24-04-2026		TLM1	CO3	T1,T2	
51.	Solenoidal fields, Irrotational fields, potential surfaces	1	25-04-2026		TLM1	CO3	T1,T2	
52.	Solenoidal fields, Irrotational fields, potential surfaces	1	27-04-2026		TLM1	CO3	T1,T2	
53.	Laplacian, second order operators	1	28-04-2026		TLM1	CO3	T1,T2	
54.	Vector Identities	1	30-04-2026		TLM1	CO3	T1,T2	
55.	Vector Identities	1	01-05-2026		TLM1	CO3	T1,T2	
56.	TUTORIAL IV	1	02-05-2026		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	04-05-2026		TLM1	CO4	T1,T2	
58.	Line Integral	1	05-05-2026		TLM1	CO4	T1,T2	
59.	Circulation	1	07-05-2026		TLM1	CO4	T1,T2	
60.	Work done	1	08-05-2026		TLM1	CO4	T1,T2	
61.	Surface Integral	1	09-05-2026		TLM1	CO4	T1,T2	
62.	Surface Integral	1	11-05-2026		TLM1	CO4	T1,T2	
63.	Flux	1	12-05-2026		TLM1	CO4	T1,T2	
64.	Green's Theorem	1	14-05-2026		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	15-05-2026		TLM1	CO4	T1,T2	
66.	Stoke's Thoerem	3	06-06-2026 01-06-2026 02-06-2026		TLM1	CO4	T1,T2	
67.	Divergence Theorem	3	04-06-2026 05-06-2026 06-06-2026		TLM1	CO4	T1,T2	
68.	TUTORIAL - V	1	08-06-2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		16			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
69.	Non-homogeneous Linear PDE with constant coefficients	3	09-06-2026 11-06-2026 12-06-2026		TLM2	CO2	T1,T2	
No. of classes		3			No. of classes taken:			
II MID EXAMINATIONS (03-06-2024 TO 08-06-2024)								

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

Dr. D. Vijay Kumar	**Dr. K.Jhansi Rani**	**Dr. A. RAMI REDDY**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF ECE

COURSE HANDOUT

PART-A

Name of Course Instructor: B. Lakshmi Thirupathamma

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

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

Program/Sem./Sec. : B.Tech/II/CSE-G **A.Y.:** 2025-26

Regulations: R23

PREREQUISITE: Physics

Course Objectives (COs)

Basic Electrical Engineering:

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

Basic Electronics Engineering

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

Course Outcomes (COs): At the end of the course, student will be able to

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

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

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

TEXTBOOKS:

1. Basic Electrical Engineering, D. C. Kulshreshtha, Tata McGraw Hill, 2019, First Edition
2. Power System Engineering, P.V. Gupta, M.L. Soni, U.S. Bhatnagar and A. Chakrabarti, Dhanpat Rai & Co, 2013

3. Fundamentals of Electrical Engineering, Rajendra Prasad, PHI publishers, 2014, Third Edition

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

REFERENCE BOOKS:

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

PART-A

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC ELECTRICAL ENGINEERING

UNIT-I: DC & AC Circuits

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and Course Outcomes	1	02-02-2026		TLM1	
2.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	03-02-2026		TLM1	
3.	Ohm's Law and its limitations, KCL & KVL **HUMAN KCL & KVL ROLE-PLAY-ITM**	1	04-02-2026 06-02-2026		TLM1	
4.	Series, Parallel, series-parallel circuits	1	09-02-2026		TLM1	
5.	Superposition theorem	1	10-02-2026		TLM1	
6.	**AC Circuits:** A.C. Fundamentals:	1	11-02-2026		TLM1	
7.	Equation of AC Voltage and current, waveform	1	13-02-2026		TLM1	
8.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	16-02-2026		TLM1	
9.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	17-02-2026		TLM1	
10.	Concept of Impedance, Active power, reactive power and apparent power	1	18-02-2026		TLM2	
11.	Concept of power factor (Simple Numerical problems).	2	18-02-2026 20-02-2026		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Machines and Measuring Instruments

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
12.	**Machines:** Construction, principle and operation of DC Motor	1	23-02-2026		TLM1	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	Construction, principle and operation of DC Generator	1	24-02-2026		TLM2	
14.	Construction, principle and operation of Single-Phase Transformer	1	25-02-2026		TLM2	
15.	Construction, principle and operation of Three Phase Induction Motor	1	27-02-2026		TLM2	
16.	Construction, principle and operation of Alternator, Applications of electrical machines	1	02-03-2026		TLM1	
17.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	2	02-03-2026 04-03-2026		TLM2	
18.	Moving Iron (MI) Instruments, Wheatstone Bridge	1	04-03-2026		TLM2	
No. of classes required to complete UNIT-II: 07				**No. of classes taken:**		

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

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
19.	**Energy Resources**: Conventional and non-conventional energy resources	1	06-03-2026		TLM1	
20.	Layout and operation of various Power Generation systems: Hydel power generation	2	09-03-2026 10-03-2026		TLM1	
21.	Layout and operation of nuclear power generation	1	11-03-2026		TLM1	
22.	Layout and operation of Solar power generation	1	13-03-2026		TLM1	
23.	**Electricity bill:** Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc. **Electricity Bill as a Story Problem-ITM**	1	13-03-2026		TLM1	
24.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers	1	16-03-2026		TLM1	
25.	**Equipment Safety Measures:** Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits.	1	17-03-2026		TLM1	
26.	**Personal Safety Measures**: Electric Shock,	1	18-03-2026		TLM1	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	Earthing and its types, Safety Precautions to avoid shock.					
No. of classes required to complete UNIT-III: 08				**No. of classes taken:**		

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

PART B: BASIC ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
27.	Introduction to Course and Course Outcomes	1	30-03-2026		TLM1	
28.	Evolution of electronics, Vacuum tubes to nano electronics	1	31-04-2026		TLM1	
29.	Characteristics of PN Junction Diode, **Role-Play Pedagogy**: "Inside the PN Junction"-ITM	1	01-04-2026		TLM1	
30.	Zener Effect — Zener Diode and its Characteristics	1	06-04-2026		TLM1	
31.	Bipolar Junction Transistor	1	07-04-2026		TLM1	
32.	Bipolar Junction Transistor	1	08-04-2026		TLM1	
33.	CB Configurations and Characteristics	1	10-04-2026		TLM2	
34.	CE Configurations and Characteristics.	1	13-04-2026		TLM2	
35.	CC Configurations and Characteristics.	1	15-04-2026		TLM2	
36.	Elementary Treatment of Small Signal CE Amplifier.	1	17-04-2026		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
37.	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	20-04-2026		TLM1	
38.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	21-04-2026		TLM1	
39.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	22-04-2026		TLM1	
40.	**Amplifiers**: Block diagram of Public Address system	1	24-04-2026		TLM1	
41.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response. **QUIZ** -ITM	1	27-04-2026		TLM2	
42.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	28-04-2026		TLM1	
43.	**Electronic Instrumentation:** Block diagram of an electronic instrumentation system.	1	29-04-2026		TLM2	

Sl.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
44.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	01-05-2026		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Digital Electronics

Sl.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Overview of Number Systems	3	04-05-2026 05-05-2026 06-05-2026		TLM1	
46.	Logic gates including Universal Gates	1	08-05-2026		TLM2	
47.	BCD codes, **Logic Gates as Decision Machines**-ITM	1	11-05-2026		TLM1	
48.	Excess-3 code, gray code	1	12-05-2026		TLM2	
49.	Hamming code	1	13-05-2026		TLM1	
50.	Boolean Algebra	1	15-05-2026		TLM1	
51.	Basic Theorems and properties of Boolean Algebra	1	01-06-2026		TLM1	
52.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	02-06-2026		TLM1	
53.	Simple combinational circuits	1	03-06-2026		TLM2	
54.	Half and Full Adders	1	05-06-2026		TLM1	
55.	Introduction to sequential circuits, Flip flops	2	08-06-2026 09-06-2026		TLM2	
56.	Registers	1	10-06-2026		TLM2	
57.	Counters	1	12-06-2026		TLM2	
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

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

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	02-02-2026	21-03-2026	8W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	8W
Summer Vacation	18-05-2026	30-05-2026	2W
II Phase of Instructions	01-06-2026	13-06-2026	2W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practicals	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	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.

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
B. Lakshmi Thirupathamma	Dr. AVGA Marthanda	Dr. G. Nageswara Rao	Dr. G. Srinivasulu

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DEPARTMENT OF COMPUTER SCIENCE AND ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor(s): **Mr. K. Venkateswara Reddy (T821), Mr. J. Subba Reddy (T668), Mr. V. Shankara Rao (T721).**

Course Name & Code	**:** Engineering Graphics – 23ME01	**Regulations**	**:** R23
L-T-P Structure	**:** 2 – 0 - 2	**Credits**	**:** 03
Program /Sem /Sec	: B.Tech/ II SEM CSE - G Section	**A.Y.**	**:** 2025-26
PREREQUISITE	**: Nil**		

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. (**Understanding Level –L2**)
CO2	Draw and interpret orthographic projections of points, lines, planes and solids in front, top and side views. (**Applying Level –L3**)
CO3	Understand and draw projection of solids in various positions in first quadrant. (**Apply –L3**)
CO4	Able to draw the development of surfaces of simple objects. (**Applying Level –L3**)
CO5	Prepare isometric and orthographic sections of simple solids. (**Applying Level –L3**)

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

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

TEXTBOOKS:

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

REFERENCE BOOKS:

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

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

UNIT - I: INTRODUCTION, GEOMETRICAL CONSTRUCTIONS, SCALES, CONICS, CYCLOIDS, INVOLUTES, ORTHOGRAPHIC PROJECTIONS OF POINTS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
01	Introduction to Engineering Graphics: COs, CEOs, POs and PEOs **UNIT I: INTRODUCTION:** Introduction to Engineering Drawing, Principles of Engineering Graphics,and their Significance	2	02-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
02	Drawing Instruments and their use-Conventions in Drawing, Lines, Lettering, and Dimensioning – BIS Conventions, Practice	3	04-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
03	**Geometrical Constructions** and Constructing regular polygons by general methods, **Scales**: Plain scales, diagonal scales, and vernier scales	2	09-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
04	Engineering **Curves**: Conic Sections, Construction of Ellipse, Parabola, and Hyperbola by general method only	3	11-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
05	Construction of Cycloids, Involutes, Normal and Tangent to Curves, Practice	2	16-02-2026		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
06	**Orthographic Projections**: Reference plane, importance of reference lines or Plane, Practice	3	18-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
07	Projections of a point situated in any one of the four quadrants, Practice	2	23-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
08	Projections of a point situated in any one of the four quadrants, Practice	3	25-02-2026		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
No. of classes required to complete UNIT - I: 20 (Lecture: 08, Practice: 12)			**No. of classes taken (including Practice):**					

UNIT-II: PROJECTIONS OF STRAIGHT LINES AND PLANES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
09	**Projections of straight lines:** Projections of straight lines parallel to both reference planes, perpendicular to one reference plane, and parallel to other reference planes, Practice	2	02-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
10	Projections of lines inclined to one reference plane and parallel to the other reference plane, Practice	3	04-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
11	Projections of Straight Line Inclined to both the reference planes, Practice	2	09-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
12	**Projections of Planes:** Projections of Regular planes Perpendicular to both reference planes, parallel to one reference plane, and inclined to the other reference plane, Practice	3	11-03-2026		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
13	Projections of planes inclined to both the reference planes, Practice	2	16-03-2026		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
14	Practice	3	18-03-2026		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
-	**I Mid Examinations: From 23-03-2026 to 28-03-2026 (Covered CO 1 & CO 2)**							
No. of classes required to complete UNIT - II: 15 (Lectures: 06, Practice: 09)			**No. of classes taken (including Practice):**					

UNIT-III: PROJECTIONS OF SOLIDS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
15	Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to HP, Practice	2	30-03-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
16	Projections of solids in simple positions: Axis perpendicular to vertical plane and Axis parallel to both the reference planes	3	01-04-2026		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
17	Projection of Solids with axis inclined to one reference plane and parallel to another plane, Practice	2	06-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
18	Numericals	3	08-04-2026		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
19	Practice	2	13-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
20	Practice	3	15-04-2026		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
No. of classes required to complete UNIT - III: 15 (Lecture: 06, Practice: 09)			**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	Learning Outcome COs	Textbook followed	HOD Sign Weekly
21	Introduction to Sections of Solids and Development of Surfaces: Perpendicular and inclined section planes	2	20-04-2026		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
22	Sectional views and True shape of section, Practice	3	22-04-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
23	Sections of solids in simple position only, Numericals	2	27-04-2026		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
24	**Development of Surfaces:** Introduction to Methods of Development of Surfaces, Parallel Line Development (Plane Surfaces), Practice	3	29-04-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
25	Radial Line Development, Numericals	2	04-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
26	Practice	3	06-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
No. of classes required to complete UNIT - IV: 15 (Lecture: 06, Practice: 09)			**No. of classes taken (including Practice):**					

UNIT-V: CONVERSION VIEWS & COMPUTER GRAPHICS:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Textbook followed	HOD Sign Weekly
27	Introduction to Isometric Views, Isometric Views of Planes, Solids	2	11-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
28	Conversion of isometric views to orthographic views , Practice	3	13-05-2026		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
29	Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views	2	01-06-2026		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
30	Practice	3	03-06-2026		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
31	**Computer Graphics**: Creating 2D&3D drawings of objects, including PCB and Transformations using Auto CAD	2	08-06-2026		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
32	Practice	3	10-06-2026		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
No. of classes required to complete UNIT - V: 10 (Lecture: 04, Practice: 06)			**No. of classes taken (including Practice):**					
Summer Vacation: 18-05-20026 to 30-05-2026; II Mid Examinations: From 15-06-20026 to 20-06-2026 (Covered CO 3, CO 4 & CO 5)								

Teaching Learning Methods:

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

PART-C

EVALUATION PROCESS for EG Course (R23 Regulation):

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

ACADEMIC CALENDAR - B.Tech - II Semester (R23):

Commencement of Class work		**02-02-2026**	
Description	**From**	**To**	**Weeks**
I Phase of Instructions	02-02-2026	21-03-2026	7 Weeks
I Mid Examinations	23-03-2026	28-03-2026	1 Week
II Phase of Instructions	30-03-2026	16-05-2026	7 Weeks
Summer Vacation	18-05-2026	30-05-2026	2 Weeks
II Phase of Instructions (Contd..)	01-06-2026	13-06-2026	2 Weeks
II Mid Examinations	15-06-2026	20-06-2026	1 Week
Preparation and Practicals	22-06-2026	27-06-2026	1 Week
Semester End Examinations	29-06-2026	11-07-2026	2 Weeks
Commencement of Next (III) Semester Class Work		**13-07-2026**	

Class Time Table - B.Tech – I Sem: MECH A - Section (R23)

↓Day / Date→	**09.00 – 10.00**	**10.00 – 11.00**	**11.00 – 12.00**	**12.00 – 13.00**	**13.00 – 14.00**	**14.00 – 15.00**	**15.00 – 16.00**
Monday				**LUNCH BREAK**		**Engineering Graphics (CSE – G)**	
Tuesday							
Wednesday	**Engineering Graphics (CSE – G)**						
Thursday							
Friday							
Saturday							

Day – to – Day work / Submission of Sheets

S.No	Unit No	Course Outcome	Sheet No. and Content
1	**I**	**CO 1**	1. Geometrical Constructions, Engineering Curves: Ellipse, Parabola, Hyperbola 2. Construction of Cycloids, involutes 3. Projections of Points
2	**II**	**CO 2**	4. Projections of straight lines 5. Projections of Planes
3	**III**	**CO 3**	6. Projections of Solids
4	**IV**	**CO 4**	7. Sections of Solids 8. Development of Surfaces
5	**V**	**CO 5**	9. Isometric views of simple solids, conversion of Isometric views to Orthographic Projections 10. Conversion of Orthographic Projections to Isometric Views

PART-D

Program Educational Objectives (PEOs):

PEO1: Pursue higher education, entrepreneurship and research to compete at global level.

PEO2: Design and develop products innovatively in the area of computer science and engineering and in other allied fields.

PEO3: Function effectively as individuals and as members of a team in the conduct of interdisciplinary projects; and even at all the levels with ethics and necessary attitude.

PEO4: Serve ever-changing needs of the society with a pragmatic perception.

Program Outcomes (POs):

PO1 - Engineering Knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.

PO2 - Problem Analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.

PO3 - Design / Development of Solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.

PO4 - Conduct Investigations of Complex Problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

PO5 - Modern Tool Usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and 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 Team Work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

PO10 - Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.

PO11 - Project Management and Finance: Demonstrate knowledge and understanding of the ring 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.

Program Specific Outcomes (PSOs):

PSO1: The ability to apply Software Engineering practices and strategies in software project development using open source programming environment for the success of organization.

PSO2: The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.

PSO3: To inculcate an ability to analyze, design and implement database applications.

Signature				
Name of the Faculty	Mr. K. Venkateswara Reddy	Mr. J. Subba Reddy	Mr. J. Subba Reddy	Dr. S. Nagarjuna Reddy
Designation / Title	Sr. Assistant Professor / Course Instructor	Associate Professor / Course Coordinator	Associate Professor/ Module Coordinator	Professor / Head of the Department

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. SRINIVASA REDDY
Course Name & Code : DATA STRUCTURES & 23CS02
L-T-P Structure : **3-1-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /G **A.Y.:** 2025-26

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, students will be able to

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

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	02-02-2026		TLM1	
2.	Definition and Importance of Linear Data Structures	1	04-02-2026		TLM1	
3.	Abstract Data Types and Implementation	1	05-02-2026		TLM1	
4.	Overview of time and space complexity	1	07-02-2026		TLM3	
5.	Analysis of Liner Data structures	2	09-02-2026 11-02-2026		TLM1	
6.	Revise Arrays	1	12-02-2026		TLM1	
7.	Searching Techniques: Linear Search	1	14-02-2026		TLM3	
8.	Binary Search & Analysis	2	16-02-2026 18-02-2026		TLM1	
9.	Bubble Sort & Analysis	1	19-02-2026		TLM1	
10.	Insertion Sort & Analysis	2	21-02-2026 23-02-2026		TLM1	
11.	Selection Sort & Analysis	1	25-02-2026		TLM1	
No. of classes required to complete UNIT-I: 14				**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	26-02-2026		TLM1	
13.	Linked List Representation	1	28-02-2026		TLM1	
14.	Sing Linked List : Operations	2	02-03-2026 05-03-2026		TLM1	
15.	Double Linked List : Operations	2	07-03-2026 09-03-2026		TLM1	
16.	Circular Single Linked List	1	11-03-2026		TLM1	
17.	Circular Double Linked List	1	12-03-2026		TLM1	
18.	Comparing Arrays and Linked List	1	14-03-2026		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	2	16-03-2026 18-03-2026		TLM1	
20.	Polynomial Addition	1	19-03-2026		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	30-03-2026		TLM1	
22.	Operations of Stacks	1	01-04-2026		TLM1	
23.	Implementation of stacks using	1	02-04-2026		TLM1	

	arrays					
24.	Stacks using Linked List	1	04-04-2026		TLM1	
25.	Expressions: Expression evaluation	2	06-04-2026 08-04-2026		TLM1	
26.	Infix to Postfix Conversion	2	09-04-2026 11-04-2026		TLM1	
27.	Checking Balanced Parenthesis	1	13-04-2026		TLM1	
28.	Reversing a List	1	15-04-2026		TLM1	
29.	Backtracking	1	16-04-2026		TLM1	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Queues

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Introduction to queues: properties and operations,	1	18-04-2026		TLM1	
31.	Implementing queues using arrays	1	20-04-2026		TLM1	
32.	Implementing queues using Linked List	1	22-04-2026		TLM1	
33.	Applications of Queue : Scheduling	1	23-04-2026		TLM1	
34.	Breadth First Search	1	25-04-2026		TLM1	
35.	Circular Queue	2	27-04-2026 29-04-2026		TLM1	
36.	Double ended queue	2	30-04-2026 02-05-2026		TLM1	
37.	Applications of Deque	1	04-05-2026		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	06-05-2026		TLM1	
39.	Representation of Trees	1	07-05-2026		TLM1	
40.	Tree Traversals	1	09-05-2026		TLM1	
41.	Binary Search Trees-Operations	2	11-05-2026 13-05-2026		TLM1	
42.	Hashing Introduction	1	14-05-2026		TLM1	
43.	Hash Functions	1	16-05-2026		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	18-05-2026		TLM1	
45.	Open Addressing: Linear Probing	1	20-05-2026		TLM1	
46.	Quadratic Probing, Double Hashing	1	21-05-2026		TLM1	
47.	Rehashing	1	23-05-2026		TLM1	
48.	Applications of Hashing	2	25-05-2026 28-05-2026		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	HOD Sign Weekly
1.	UNIT-I Revision	2	01-06-2026 03-06-2026			
2.	UNIT-II Revision	2	04-06-2026 06-06-2026			
3.	UNIT-III Revision	1	08-06-2026			
4.	UNIT-IV Revision	1	10-06-2026			
5.	UNIT-V Revision	2	11-06-2026 13-06-2026			
No. of classes		08				

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:**	B. Tech., II-Sem., CSE-G
ACADEMIC YEAR	**:**	2025-2026
COURSE NAME & CODE	**:**	ENGINEERING PHYSICS LAB & 23FE53
L-T-P STRUCTURE	**:**	0-0-2
COURSE CREDITS	**:**	1
COURSE INSTRUCTOR	**:**	**Dr. S. YUSUB** / Dr. K. KUMAR RAJA
COURSE COORDINATOR	**:**	**Dr. S. YUSUB**

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

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

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

Engineering Physics Lab	
COURSE DESIGNED BY	**FRESHMAN ENGINEERING DEPARTMENT**
Course Outcomes	**Programme Outcomes**

PO's →	1	2	3	4	5	6	7	8	9	10	11	12
CO1.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO2.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO3.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO4.	**3**	**3**	**2**	**1**				**1**	1			**1**
CO5.	**3**	**3**	**2**	**1**				**1**	**1**			**1**
1 = slight (Low) 2 = Moderate (Medium) 3 = Substantial (High)												

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

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

Part-B

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

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction	3	05-02-2026		**TLM4**	1,2,3,4	T4	
2.	Demonstration	3	12-02-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
3.	Experiment 1	3	19-02-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
4.	Experiment 2	3	26-02-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
5.	Experiment 3	3	05-03-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
6.	Experiment 4	3	02-04-2026		**TLM4**	CO1, CO2, CO3, CO4	T4	
7.	Experiment 5	3	09-04-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
8.	Demonstration	3	16-04-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
9.	Experiment 6	3	23-04-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
10.	Experiment 7	3	30-04-2026		**TLM4**	CO1, CO2, CO3, CO4,	T4	

						CO5		
11.	Experiment 8	3	07-05-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
12.	Experiment 9	3	14-05-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
13.	Experiment 10	3	04-06-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
14.	**Internal Exam**	3	11-06-2026		**TLM4**	CO1, CO2, CO3, CO4, CO5	T4	
No. of classes required to complete LAB		48			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)

Graduates of ECE program will be:

PEO 1. To Attain a solid foundation in Electronics & Communication Engineering fundamentals with an attitude to pursue continuing education.

PEO 2. To Function professionally in the rapidly changing world with advances in technology.

PEO 3. To Contribute to the needs of the society in solving technical problems using Electronics & Communication Engineering principles, tools and practices.

PEO 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 / Dr. K. KUMAR RAJA	Dr. S. YUSUB	Dr. S. YUSUB	Dr. T. SATYANARAYANA

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

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

DEPARTMENT OF ECE

LAB HANDOUT

PART-A

Date: 02-02-2026

Name of Course Instructor : Ms. B. Lakshmi Thirupathamma /Mr. T. Anil Raju
Mr. M. Siva Sankara Rao/Mr. P. Venkateswara Rao

Course Name & Code : Electrical & Electronics Engineering Workshop -23EE51

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

Program/Sem/Sec **:** B.Tech., II-Sem.,CSE-G **A.Y.**: 2025-26

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-L3**)
CO2	Compute medium resistance using Wheat stone bridge. (**Apply-L3**)
CO3	Discover critical field resistance and critical speed of DC shunt generators. (**Apply-L3**)
CO4	Estimate reactive power and power factor in electrical loads. (**Understand-L2**)
CO5	Plot the characteristics of semiconductor devices. (**Apply-L3**)
CO6	Demonstrate the working of various logic gates using ICs. (**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	PSO4
CO1	3	2						2	3	2		1				
CO2	2	2		2				2	2	2						
CO3	2	2	2	2				2	2	2				2		
CO4	2	2		3				2	3	2		1	2			
CO5	3	2			2			2	2	2	1	1	2	2	3	2
CO6	3	3		2	2			2	3	3		1			3	
1 - Low **2 –**Medium **3 -** High																

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to BEEE Lab (Function Generators, CRO, RPS, Breadboard etc), Course Objectives and Outcomes.	3	06-02-2026		TLM4	
2.	Verification of KCL and KVL, Verification of Superposition Theorem					
	Measurement of Resistance using Wheat stone bridge	3	13-02-2026		TLM4	
3.	Magnetization Characteristics of DC Shunt Generator	3	20-02-2026		TLM4	
4.	Measurement of Power and Power factor using Single-phase wattmeter	3	27-02-2026		TLM4	
5.	Calculation of Electrical Energy for Domestic Premises	3	06-03-2026		TLM4	
6.	Internal Lab Examination (**Electricals**)	3	13-03-2026		TLM4	
7.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	03-04-2026		TLM4	
8.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.					
9.	Implementation of half wave and full wave rectifiers	3	10-04-2026		TLM4	
10.	Plot Input & Output characteristics of BJT in CE and CB configurations	3	17-04-2026		TLM4	
11.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	01-05-2026		TLM4	
12.	Verification of S R flip flop and J K flip flop		08-05-2026		TLM4	
13.	Internal Lab Examination (**Electronics**)	3	05-06-2026		TLM4	
No. of classes required: 42				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work	1,2,3,4,5,6,7,8…	A1 =10
Record and observation	1,2,3,4,5,6,7,8…	B1 = 5

Internal Exam	1,2,3,4,5,6,7,8…	**C1=15**
Cumulative Internal Examination (CIE):(A1+B1+C1)	1,2,3,4,5,6,7,8…	**30**
Semester End Examination (SEE)	1,2,3,4,5,6,7,8…	**70**
Total Marks=CIE+SEE		**100**

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Date: 02-02-2026

Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Ms. B. Lakshmi Thirupathamma Mr. T. Anil Raju Mr .M. Siva Sankara Rao Mr. P. Venkateswara Rao	Dr. AVGA Marthanda	Dr. G. Nageswara Rao	Dr. G. Srinivasulu

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DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. S. SRINIVASA REDDY
Course Name & Code **:** DATA STRUCTURES LAB & 23CS52
L-T-P Structure **: 0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/G **A.Y.:** 2025-26

PREREQUISITE: PPSC

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Array Manipulations	3	14-02-2026		
2.	Searching and Sorting Techniques	3	21-02-2026		
3.	Single Linked List	3	28-02-2026		
4.	Double Linked List	3	07-03-2026		
5.	Circular Linked List	3	14-03-2026		
6.	Polynomial Representation & Polynomial Addition	3	04-04-2026		
7.	Linked List Applications	3	11-04-2026		
8.	Stack Implementation	3	18-04-2026		
9.	Stack Applications	3	25-04-2026		
10.	Queue Implementation & Circular Queue	3	02-05-2026		
11.	Double Ended Queue	3	09-05-2026		
12.	Trees	3	16-05-2026		
13.	Hashing	3	06-06-2026		
14.	Internal Exam	3	13-06-2026		

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A. S. R. C. Murthy.
Course Name & Code **:** DATA STRUCTURES & 23CS02
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech/CSE/II /H **A.Y.:** 2025-26

PREREQUISITE: Introduction to Programming-23CS01

COURSE EDUCATIONAL OBJECTIVES(CEO):

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

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

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Linear Data Structures

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction and Discussion of CO's	1	02-02-2026		TLM1	
2.	Definition and Importance of Linear Data Structures	1	04-02-2026		TLM1	
3.	Abstract Data Types and Implementation	1	06-02-2026		TLM1	
4.	Overview of time and space complexity	1	07-02-2026		TLM1	
5.	Analysis of Liner Data structures	2	09-02-2026 11-02-2026		TLM1	
6.	Revise Arrays	1	13-02-2026		TLM1	
7.	Searching Techniques: Linear Search	1	14-02-2026		TLM1	
8.	Binary Search & Analysis	2	16-02-2026 18-02-2026		TLM1	
9.	Bubble Sort & Analysis	1	20-02-2026		TLM1	
10.	Insertion Sort & Analysis	2	21-02-2026 23-02-2026		TLM1	
11.	Selection Sort & Analysis	2	25-02-2026 27-02-2026		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	28-02-2026		TLM1	
13.	Linked List Representation	1	02-03-2026		TLM1	
14.	Sing Linked List : Operations	2	04-03-2026 06-03-2026		TLM1	
15.	Double Linked List : Operations	2	07-03-2026 09-03-2026		TLM1	
16.	Circular Single Linked List	1	11-03-2026		TLM1	
17.	Circular Double Linked List	2	13-03-2026 14-03-2026		TLM1	
18.	Comparing Arrays and Linked List	1	16-03-2026		TLM1	
19.	Applications of Linked Lists: Polynomial Representation	1	18-03-2026		TLM1	
20.	Polynomial Addition	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: Stacks:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction to Stacks : Properties	1	30-03-2026		TLM1	
22.	Operations of Stacks	1	01-04-2026		TLM1	
23.	Implementation of stacks using arrays	1	04-04-2026		TLM1	

24.	Stacks using Linked List	1	06-04-2026		TLM1	
25.	Expressions: Expression evaluation	2	08-04-2026 10-04-2026		TLM1	
26.	Infix to Postfix Conversion	2	11-04-2026 13-04-2026		TLM1	
27.	Checking Balanced Parenthesis	2	15-04-2026 17-04-2026		TLM1	
28.	Reversing a List	1	18-04-2026		TLM1	
29.	Backtracking	1	20-04-2026		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	22-04-2026		TLM1	
31.	Implementing queues using arrays	1	24-04-2026		TLM1	
32.	Implementing queues using Linked List	1	25-04-2026		TLM1	
33.	Applications of Queue : Scheduling	1	27-04-2026		TLM1	
34.	Breadth First Search	1	29-04-2026		TLM1	
35.	Circular Queue	1	01-05-2026		TLM1	
36.	Double ended queue	1	02-05-2026		TLM1	
37.	Applications of Deque	1	04-05-2026		TLM1	
No. of classes required to complete UNIT-IV: 8				**No. of classes taken:**		

UNIT-V: TREES & HASHING TECHNQIUES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Introduction to Trees,	1	06-05-2026		TLM1	
39.	Representation of Trees	1	08-05-2026		TLM1	
40.	Tree Traversals	1	09-05-2026		TLM1	
41.	Binary Search Trees-Operations	2	11-05-2026 13-05-2026		TLM1	
42.	Hashing Introduction	1	15-05-2026		TLM1	
43.	Hash Functions	1	16-05-2026		TLM1	
44.	Collison Resolution Techniques: Separate Chaining	1	01-06-2026		TLM1	
45.	Open Addressing: Linear Probing	1	03-06-2026		TLM1	
46.	Quadratic Probing, Double Hashing	1	05-06-2026		TLM1	
47.	Rehashing, Applications of Hashing	1	06-06-2026		TLM1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Content Beyond Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Evaluation of Prefix Expression, Towers of Hanoi, Extendable Hashing	2	08-06-2026 10-06-2026					
No. of classes		2			No. of classes taken:			
II MID EXAMINATIONS (15-06-2026 TO 20-06-2026)								

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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

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

DEPARTMENT OF COMPUTER SCIENCE & ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. A. S. R. C. Murthy
Course Name & Code : DATA STRUCTURES LAB & 23CS52
L-T-P Structure : **0-0-3** **Credits:** 1.5
Program/Sem/Sec : B.Tech/CSE/II/H **A.Y.:** 2025-26

PREREQUISITE: PPSC

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

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

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

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

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

PART-B:

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign
1.	Array Manipulations	3	02-02-2026		
2.	Searching and Sorting Techniques	3	09-02-2026		
3.	Single Linked List	6	16-02-2026 23-02-2026		
4.	Double Linked List	6	02-03-2026 09-03-2026		
5.	Circular Linked List	3	16-03-2026		
6.	Polynomial Representation & Polynomial Addition	3	30-03-2026		
7.	Linked List Applications	3	06-04-2026		
8.	Stack Implementation	3	13-04-2026		
9.	Stack Applications	3	20-04-2026		
10.	Queue Implementation & Circular Queue	3	27-04-2026		
11.	Double Ended Queue	3	04-05-2026		
12.	Trees	3	11-05-2026		
13.	Hashing	3	01-06-2026		
14.	Internal Exam	3	08-06-2026		

PART-C

EVALUATION PROCESS (R23 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis:** Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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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 oforganization.
PSO 2	The ability to design and develop computer programs in networking, web applications and IoT as per the society needs.
PSO 3	To inculcate an ability to analyze, design and implement database applications.

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

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

DEPARTMENT OF ECE

COURSE HANDOUT

PART-A

Name of Course Instructor: Mrs. B. Rajeswari **Date**: 02-02-2026
Course Name & Code **:** Basic Electrical & Electronics Engineering – 23EE01
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem./Sec. : B.Tech/II/CSE-H **A.Y.:** 2025-26
Regulations: R23

PREREQUISITE: Physics

Course Objectives (COs)

Basic Electrical Engineering:
To expose to the field of electrical & electronics engineering, laws and principles of electrical/ electronic engineering and to acquire fundamental knowledge in the relevant field.
Basic Electronics Engineering
To teach the fundamentals of semiconductor devices and its applications, principles of digital electronics.

Course Outcomes (COs): At the end of the course, student will be able to

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

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

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

TEXTBOOKS:

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

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

REFERENCE BOOKS:

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

PART A: BASIC ELECTRICAL ENGINEERING

UNIT-I: DC & AC Circuits

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48.	Introduction to Course and Course Outcomes	1	03-02-2026		TLM1	
49.	**DC Circuits:** Electrical circuit elements (R, L and C)	1	04-02-2026		TLM1	
50.	Ohm's Law and its limitations, KCL & KVL	1	05-02-2026		TLM1	
51.	Series, Parallel, series-parallel circuits	1	06-02-2026		TLM1	
52.	Superposition theorem	1	10-02-2026		TLM1	
53.	**AC Circuits:** A.C. Fundamentals:	1	11-02-2026		TLM1	
54.	Equation of AC Voltage and current, waveform	1	12-02-2026		TLM1	
55.	Time period, frequency, amplitude, phase, phase difference, average value, RMS value	1	13-02-2026		TLM1	
56.	Form factor, peak factor, Voltage and current relationship with phasor diagrams in R, L, and C circuits	1	17-02-2026		TLM1	
57.	Concept of Impedance, Active power, reactive power and apparent power	1	18-02-2026		TLM2	
58.	Concept of power factor (Simple Numerical problems).	1	19-02-2026		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Machines and Measuring Instruments

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
59.	**Machines:** Construction, principle and operation of DC Motor	1	20-02-2026		TLM1	
60.	Construction, principle and operation of DC Generator	1	24-02-2026		TLM2	
61.	Construction, principle and operation of Single-Phase Transformer	1	25-02-2026		TLM2	

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
62.	Construction, principle and operation of Three Phase Induction Motor	1	26-02-2026		TLM2	
63.	Construction, principle and operation of Alternator, Applications of electrical machines	1	27-02-2026		TLM1	
64.	**Measuring Instruments:** Construction and working principle of Permanent Magnet Moving Coil (PMMC)	1	04-03-2026		TLM2	
65.	Moving Iron (MI) Instruments, Wheatstone Bridge	1	05-03-2026		TLM2	
No. of classes required to complete UNIT-II: 07				**No. of classes taken:**		

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

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
66.	**Energy Resources**: Conventional and non-conventional energy resources	1	06-03-2026		TLM1	
67.	Layout and operation of various Power Generation systems: Hydel power generation	1	10-03-2026		TLM1	
68.	Layout and operation of nuclear power generation	1	11-03-2026		TLM1	
69.	Layout and operation of Solar power generation	1	12-03-2026		TLM1	
70.	**Electricity bill:** Power rating of household appliances including air conditioners PCs, Laptops, Printers, etc.	1	13-03-2026		TLM1	
71.	Definition of "unit" used for consumption of electrical energy, two-part electricity tariff, Calculation of electricity bill for domestic consumers	1	17-03-2026		TLM1	
72.	**Equipment Safety Measures:** Working principle of Fuse and Miniature Circuit Breaker (MCB), merits and demerits.	1	18-03-2026		TLM1	
73.	**Personal Safety Measures**: Electric Shock, Earthing and its types, Safety Precautions to avoid shock.	1	20-03-2026		TLM1	
No. of classes required to complete UNIT-III: 08				**No. of classes taken:**		

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

PART B: BASIC ELECTRONICS ENGINEERING

UNIT-I: Semiconductor Devices

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
74.	Introduction to Course and Course Outcomes	1	31-03-2026		TLM1	
75.	Evolution of electronics, Vacuum tubes to nano electronics	1	01-04-2026		TLM1	
76.	Characteristics of PN Junction Diode	1	02-04-2026		TLM1	
77.	Zener Effect — Zener Diode and its Characteristics	1	07-04-2026		TLM1	
78.	Bipolar Junction Transistor	1	08-04-2026		TLM1	
79.	Bipolar Junction Transistor	1	09-04-2026		TLM1	
80.	CB Configurations and Characteristics	1	10-04-2026		TLM2	
81.	CE Configurations and Characteristics.	1	15-04-2026		TLM2	
82.	CC Configurations and Characteristics.	1	16-04-2026		TLM2	
83.	Elementary Treatment of Small Signal CE Amplifier.	1	17-04-2026		TLM1	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Basic Electronic Circuits and Instrumentation

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
84.	**Rectifiers and power supplies**: Block diagram description of a DC power supply	1	21-04-2026		TLM1	
85.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	22-04-2026		TLM1	
86.	Working of full wave bridge rectifier, capacitor filter (no analysis)	1	23-04-2026		TLM1	
87.	**Amplifiers**: Block diagram of Public Address system	1	24-04-2026		TLM1	
88.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	28-04-2026		TLM2	
89.	Circuit diagram and working of common emitter (RC coupled) amplifier with its frequency response.	1	29-04-2026		TLM1	
90.	**Electronic Instrumentation:** Block diagram of an electronic instrumentation system.	1	30-04-2026		TLM2	
91.	Electronic Instrumentation: Block diagram of an electronic instrumentation system.	1	01-05-2026		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Digital Electronics

SI.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
92.	Overview of Number Systems	3	05-05-2026 06-05-2026 07-05-2026		TLM1	
93.	Logic gates including Universal Gates	1	08-05-2026		TLM2	
94.	BCD codes	1	12-05-2026		TLM1	
95.	Excess-3 code, gray code	1	13-05-2026		TLM2	
96.	Hamming code	1	14-05-2026		TLM1	
97.	Boolean Algebra	1	15-05-2026		TLM1	
98.	Basic Theorems and properties of Boolean Algebra	1	02-06-2026		TLM1	
99.	Truth Tables and Functionality of Logic Gates NOT, OR, AND, NOR, NAND, XOR and XNOR	1	03-06-2026		TLM1	
100.	Simple combinational circuits	1	04-06-2026		TLM2	
101.	Half and Full Adders	1	05-06-2026		TLM1	
102.	Introduction to sequential circuits, Flip flops	2	09-06-2026 10-06-2026		TLM2	
103.	Registers	1	11-06-2026		TLM2	
104.	Counters		12-06-2026			
No. of classes required to complete UNIT-III: 15				**No. of classes taken:**		

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

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	02-02-2026	21-03-2026	8W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	8W
Summer Vacation	18-05-2026	30-05-2026	2W

II Phase of Instructions	01-06-2026	13-06-2026	2W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practicals	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	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.

Date: 02-02-2026

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Mrs. B. Rajeswari	Dr. AVGA Marthanda	Dr. G. Nageswara Rao	Dr. G. Srinivasulu

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

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

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

DEPARTMENT OF ECE

LAB HANDOUT

PART-A

Date: 02-02-2026

Name of Course Instructor : Mrs. B. Rajeswari , Mr. N. Dharmachari
Ms. B. Lakshmi Thirupathamma Mrs. M.V.L Bhavani

Course Name & Code : Electrical & Electronics Engineering Workshop -23EE51

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

Program/Sem/Sec : B.Tech., II-Sem.,CSE-H **A.Y.** : 2025-26

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-L3**)
CO2	Compute medium resistance using Wheat stone bridge. (**Apply-L3**)
CO3	Discover critical field resistance and critical speed of DC shunt generators. (**Apply-L3**)
CO4	Estimate reactive power and power factor in electrical loads. (**Understand-L2**)
CO5	Plot the characteristics of semiconductor devices. (**Apply-L3**)
CO6	Demonstrate the working of various logic gates using ICs. (**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	PSO4
CO1	3	2						2	3	2		1				
CO2	2	2		2				2	2	2						
CO3	2	2	2	2				2	2	2				2		
CO4	2	2		3				2	3	2		1	2			
CO5	3	2			2			2	2	2	1	1	2	2	3	2
CO6	3	3		2	2			2	3	3		1			3	
1 - Low				**2** –Medium								**3** - High				

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S.No.	Topics to be covered. (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to BEEE Lab (Function Generators, CRO, RPS, Breadboard etc), Course Objectives and Outcomes.		07-02-2026		TLM4	

2.	Verification of KCL and KVL, Verification of Superposition Theorem	3				
	Measurement of Resistance using Wheat stone bridge	3	14-02-2026		TLM4	
3.	Magnetization Characteristics of DC Shunt Generator	3	21-02-2026		TLM4	
4.	Measurement of Power and Power factor using Single-phase wattmeter	3	28-02-2026		TLM4	
5.	Calculation of Electrical Energy for Domestic Premises	3	07-03-2026		TLM4	
6.	Internal Lab Examination (**Electricals**)	3	28-03-2026		TLM4	
7.	Plot V-I characteristics of PN Junction diode A) Forward bias B) Reverse bias.	3	04-04-2026		TLM4	
8.	Plot V – I characteristics of Zener Diode and its application as voltage Regulator.					
9.	Implementation of half wave and full wave rectifiers	3	18-04-2026		TLM4	
10.	Plot Input & Output characteristics of BJT in CE and CB configurations	3	25-04-2026		TLM4	
11.	Frequency response of CE amplifier.	3	02-05-2026		TLM4	
12.	Verification of Truth Table of AND, OR, NOT, NAND, NOR, Ex-OR, Ex-NOR gates using ICs	3	16-05-2026		TLM4	
13.	Internal Lab Examination (**Electronics**)	3	06-06-2026		TLM4	
No. of classes required: 42				**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.
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PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Date: 02-02-2026

Course Instructor	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Mrs. B. Rajeswari, Mr. N. Dharmachari Ms. B. Lakshmi Thirupathamma Mrs. M.V.L Bhavani	Dr. AVGA Marthanda	Dr. G. Nageswara Rao	Dr. G. Srinivasulu

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

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM	**:I B.Tech.,II-Sem.,CSE-H**
ACADEMICYEAR	**:2025-26**
COURSENAME &CODE	**: ENGINEERING PHYSICS**
L-T-PSTRUCTURE	**:4-0-0**
COURSECREDITS	**3**
COURSEINSTRUCTOR	**:Dr. P. Sobhanachalam**
PRE-REQUISITE	**:Basic Knowledge of Physics**

Course Objectives:

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

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

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

COURSEARTICULATIONMATRIX(Correlation between COs, Pos & PSOs):

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

TEXT BOOKS

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

REFERENCES

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

WEBRESOURCES

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

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

PART-B

COURSEDELIVERYPLAN(LESSONPLAN):

UNIT-I:INTERFERENCE,DIFFRACTION& POLARIZATION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Introduction to the Subject, Course Outcomes	1	2.2.26		**TLM-2**		
2.	Principle of superposition, Interference of light	1	3.2.26		**TLM-3**		
3.	Interference in thin films by reflection & applications	1	6.2.26		**TLM-2**		
4.	Colors in thin films, Newton's rings	1	7.2.26		**TLM-1**		
5.	Determination of wav and refractive index	1	9.2.26		**TLM-4**		
6.	Problems& Assignment/Quiz	1	10.2.26		**TLM-1**		
7.	Introduction, Fresnel and Fraunhoffer diffractions	1	13.2.26		**TLM-3**		

8.	Fraunhoffer diffraction due to single slit	1	14.2.26		**TLM-2**		
9.	Double slit& N slits(Qualitative)	1	16.2.26		**TLM-4**		
10.	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	17.2.26		**TLM-4**		
11.	Problems& Assignment/Quiz	1	20.2.26		**TLM-3**		
12.	Introduction – Types of polarization	1	21.2.26		**TLM-2**		
13.	Polarization by reflection, refraction & double refraction	1	23.2.26		**TLM-2**		
14.	Nicol's prism	1	24.2.26		**TLM-5**		
15.	Half wave and Quarter wave plates	1	27.2.26		**TLM-2**		
16.	Problems& Assignment/Quiz	1	28.2.26		**TLM-3**		
No.of classes required to complete UNIT-I:16				No.of classes taken:			

UNIT-II:CRYSTALLOGRAPHY & X– RAY DIFFRACTION

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Space lattice; Basis, Unit cell & Lattice parameters	1	2.3.26		**TLM-3**		
2.	Bravais Lattices	1	6.3.26		**TLM-2**		
3.	Crystal Systems(3D)	1	7.3.26		**TLM-2**		
4.	Coordination number – Packing fraction of –SC, BCC	1	9.3.26		**TLM-1**		
5.	Coordination number – Packing fraction of FCC	1	10.3.26		**TLM-1**		
6.	Miller indices& Properties	1	13.3.26		**TLM-2**		
7.	Separation between successive (hkl) planes	1	14.3.26		**TLM-1**		
8.	Bragg's law; X–ray Diffractometer	1	16.3.26		**TLM-3**		
9.	Crystal Structure determination by Laue's method	1	17.3.26		**TLM-2**		

10.	Crystal Structure determination by Powder method	1	20.3.26		**TLM-5**		
11.	MID-1 Examinations	1	23.3.26		**----**		
12.	MID-1 Examinations	1	24.3.26		**----**		
13.	MID-1 Examinations	1	27.3.26		**----**		
14.	MID-1 Examinations	1	28.3.26		**----**		
No.of classes required to complete UNIT-II: 14				No.of classes taken:			

UNIT-III :DIELECTRIC & MAGNETIC MATERIALS

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

S.No	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dielectric polarization Dielectric polarizability, Susceptibility	1	30.3.26		**TLM-2**		
2.	Dielectric constant & Displacement Vector, Relation between the electric vectors	1	31.3.26		**TLM-3**		
3.	Types of polarizations-Electronic polarization	1	4.4.26		**TLM-1**		
4.	Types of polarizations- ionic & orientation polarizations (Qualitative)	1	6.4.26		**TLM-1**		
5.	Lorentz internal field	1	7.4.26		**TLM-2**		
6.	Claussius-Mosotti equation, Complex dielectric constant	1	10.4.26		**TLM-1**		
7.	Frequency dependence of polarization dielectric loss	1	11.4.26		**TLM-5**		
8.	Problems& Assignment/Quiz	1	13.4.26		**TLM-3**		
9.	Introduction Magnetic dipole moment, Magnetization Magnetic susceptibility & permeability	1	17.4.26		**TLM-4**		
10.	Atomic origin of magnetism	1	18.4.26		**TLM-1**		

11.	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	20.4.26		**TLM-2**		
12.	Domain concept for Ferromagnetism & Domain walls	1	21.4.26		**TLM-2**		
13.	Hysteresis	1	24.4.26		**TLM-5**		
14.	soft and hard magnetic materials	1	25.4.26		**TLM-1**		
15.	Problems& Assignment/Quiz	1	27.4.26		**TLM-3**		
No.of classes required to complete UNIT-III:15				No.of classes taken:			

UNIT-IV :QUANTUM MECHANICS&FREEELECTRONTHEORY

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Dual nature of matter,De-Broglie's Hypothesis	1	28.4.26		**TLM-2**		
2.	Heisenberg's Uncertainty Principle	1	1.5.26		**TLM-2**		
3.	Significance & properties of wave function	1	2.5.26		**TLM-2**		
4.	Schrodinger's time independent and dependent wave equations	1	4.5.26		**TLM-1**		
5.	Particle in a one – dimensional infinite potential well	1	5.5.26		**TLM-1**		
6.	Problems& Assignment/Quiz	1	8.5.26		**TLM-3**		
7.	Classical free electron theory- merits and demerits, Quantum free electron theory	1	9.5.26		**TLM-2**		
8.	Electrical conductivity based on quantum free electron theory	1	11.5.26		**TLM-1**		
9.	Fermi -Dirac distribution and temperature dependence	1	12.5.26		**TLM-5**		
10.	Density of states, Fermi energy	1	15.5.26		**TLM-1**		
11.	Problems& Assignment/Quiz	1	16.5.26		**TLM-3**		
No.of classes required to complete UNIT-IV:11				No.of classes taken:			

UNIT-V:SEMICONDUCTORPHYSICS

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

S.No.	Topics to be covered	No.of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign	Remarks
1.	Formation of energy bands, Classification of crystalline solids	1	1.6.26		**TLM-6**		
2.	Intrinsic semiconductors, Density of charge carriers	1	2.6.26		**TLM-1**		
3.	Electrical conductivity, Fermi level	1	5.6.26		**TLM-2**		
4.	Extrinsic semiconductors, Density of charge carriers	1	6.6.26		**TLM-1**		
5.	Dependence of Fermi energy on carrier concentration &temperature	1	8.6.26		**TLM-2**		
6.	Drift and Diffusion Currents, Einstein's equation	1	9.6.26		**TLM-1**		
7.	Hall Effect & its applications	1	12.6.26		**TLM-4**		
8.	Problems& Assignment/Quiz	1	13.6.26		**TLM-3**		
9.	MID-2 Examinations	1	15.6.26		**----**		
10.	MID-2 Examinations	1	16.6.26		**----**		
11.	MID-2 Examinations	1	19.6.26		**----**		
12.	MID-2 Examinations	1	20..6.26		**----**		
No.of classes required to complete UNIT-V:12				No.of classes taken:			

PART-C

EVALUATION PROCESS(R-23Regulation)

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

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

PART-D

PROGRAMMEOUTCOMES(POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering-fundamentals,andanengineeringspecializationtothesolutionofcomplex engineeringproblems.
PO 2	**Problem analysis**:Identify,formulate,review research literature,and analyze complexengineeringproblemsreachingsubstantiatedconclusionsusingfirstprinciplesofmathematics,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 needswithappropriateconsiderationforthepublichealthandsafety,and the cultural, societal,and environmental considerations.
PO 4	**Conductinvestigationsofcomplexproblems**:Useresearch-basedknowledgeand Research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Moderntoolusage**:Create,select,andapplyappropriatetechniques,resources,and modernengineeringandITtoolsincludingpredictionandmodelingtocomplexengineeringactivitieswithanunderstandingofthe 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	**Individualandteamwork**:Functioneffectivelyasanindividual,andasamember orleaderindiverseteams,andinmultidisciplinarysettings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large,such as,beingabletocomprehendandwriteeffectivereportsanddesigndocumentation,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**:Recognizetheneedforandhavethepreparationandabilityto engageinindependentandlife-longlearninginthebroadestcontextoftechnologicalchange.

CourseInstructor	CourseCoordinator	ModuleCoordinator	HOD
Dr. P. Sobhanachalam	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.T. Satyanarayana**

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

Part-A

PROGRAM	**:**	**B.Tech.,II-Sem.,CSE-H**
ACADEMICYEAR	**:**	**2025-26**
COURSENAME &CODE	**:**	**ENGINEERING PHYSICS LAB**
L-T-PSTRUCTURE	**:**	**0 – 0 – 3**
COURSECREDITS	**:**	**1**
COURSEINSTRUCTOR	**:**	**Dr. P.Sobhanachalam / Dr. N. Aruna**
COURSECOORDINATOR	**:**	
Pre-requisites	**:**	**Nil**

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

Course Outcomes:

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

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

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

List of Experiments

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

References:

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

BOSAPPROVEDTEXTBOOKS:

1. LabManualPreparedbytheLBRCE.

EVALUATIONPROCESS:

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

Part-B

COURSEDELIVERYPLAN (LESSONPLAN): CSE-H

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	TeachingLearningMethods	Learning Outcome COs	fo
1.	Introduction & Demonstration, Experiment1	3	3.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
2.	Experiment2	3	10.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
3.	Experiment3	3	17.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
4.	Experiment 3	3	24.2.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
5.	Experiment 4	3	10.3.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
6.	Experiment5	3	17.3.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
7.	**MID-1 Exam**	3	24.3.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
8.	Experiment 6	3	31.3.26		**---**	**---**	
9.	Experiment 7	3	7.4.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
10.	Experiment8	3	21.4.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
11.	Experiment 8	3	28.4.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
12.	Experiment 9	3	5.5.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
13.	Experiment 10	3	12.5.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
14.	**Internal Exam**	3	2.6.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
15.	**Internal Exam**	3	9.6.26		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	
16.	**MID-2 Exam**	3	16.6.26		**---**	**---**	
No.of classes required to completed		14			No.of classes taken:		

PROGRAM OUT COMES: Engineering Graduates will be able to:

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

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

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

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

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

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

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

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

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

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

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

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

Course Instructor	Course Coordinator	Module Coordinator	H.O.D
Dr. P. Sobhanachalam /Dr.N. Aruna	**Dr.S.YUSUF**	**Dr.S.YUSUF**	**Dr.T. Satyanarayana**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., II-Sem. CSE-H
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**:** Differential Equations & Vector Calculus
L-T-P STRUCTURE	**:** 3-0-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. T. Radha Rani
COURSE COORDINATOR	**:** Dr. K. Jhansi Rani

PRE-REQUISITES **:** Basics of Vectors**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs):

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

COURSE OUTCOMES (COs)

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

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

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

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

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

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

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

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

BOS APPROVED TEXT BOOKS:

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

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

BOS APPROVED REFERENCE BOOKS:

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

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

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

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

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	02-02-2026		TLM2			
2.	Course Outcomes, Program Outcomes	1	03-02-2026		TLM2			

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

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	04-02-2026		TLM1	CO1	T1,T2	
4.	Linear Differential equation	1	05-02-2026		TLM1	CO1	T1,T2	
5.	Bernoulli's DE	1	07-02-2026		TLM1	CO1	T1,T2	
6.	Exact DE	1	09-02-2026		TLM1	CO1	T1,T2	
7.	Exact DE	1	10-02-2026		TLM1	CO1	T1,T2	
8.	TUTORIAL – I	1	11-02-2026		TLM3	CO1	T1,T2	
9.	Non-exact DE Type II	1	12-02-2026		TLM1	CO1	T1,T2	
10.	Non-exact DE Type I	1	14-02-2026		TLM1	CO1	T1,T2	
11.	Non-exact DE Type III	1	16-02-2026		TLM1	CO1	T1,T2	
12.	Non-exact DE Type IV	1	17-02-2026		TLM1	CO1	T1,T2	
13.	TUTORIAL – II	1	18-02-2026		TLM3	CO1	T1,T2	
14.	Newton's Law of cooling	1	19-02-2026		TLM1	CO1	T1,T2	
15.	Law of natural growth and decay	1	21-02-2026		TLM1	CO1	T1,T2	
16.	Law of natural growth and decay	1	23-02-2026		TLM1	CO1	T1,T2	
17.	Electrical circuits	1	24-02-2026		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		17			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	25-02-2026		TLM1	CO1	T1,T2	
19.	Solving a homogeneous DE	1	26-02-2026		TLM1	CO1	T1,T2	
20.	Solving a homogeneous DE	1	28-02-2026		TLM1	CO1	T1,T2	
21.	Finding Particular Integral, P.I for e^{ax+b}	1	02-03-2026		TLM1	CO1	T1,T2	
22.	P.I for Cos bx, or sin bx	1	04-03-2026		TLM1	CO1	T1,T2	
23.	TUTORIAL - III	1	05-03-2026		TLM3	CO1	T1,T2	
24.	P.I for polynomial function	1	07-03-2026		TLM1	CO1	T1,T2	
25.	P.I for $e^{ax+b}v(x)$	1	09-03-2026		TLM1	CO1	T1,T2	

26.	P.I for $x^k v(x)$	1	10-03-2026		TLM1	CO1	T1,T2	
27.	Method of Variation of parameters	1	11-03-2026		TLM1	CO1	T1,T2	
28.	TUTORIAL – IV	1	12-03-2026		TLM3	CO1	T1,T2	
29.	Simultaneous linear equations	1	14-03-2026		TLM1	CO1	T1,T2	
30.	Simultaneous linear equations	1	16-03-2026		TLM1	CO1	T1,T2	
31.	L-C-R circuits	1	17-03-2026		TLM1	CO1	T1,T2	
32.	Simple Harmonic motion	1	18-03-2026		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		15			No. of classes taken:			

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

UNIT-III: Partial Differential Equations

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
33.	Introduction to Unit III	1	30-03-2026		TLM1	CO2	T1,T2	
34.	Formation of PDE by elimination of arbitrary constants	1	31-03-2026		TLM1	CO2	T1,T2	
35.	TUTORIAL - IV	1	01-04-2026		TLM3	CO2	T1,T2	
36.	Formation of PDE by elimination of arbitrary functions	1	02-04-2026		TLM1	CO2	T1,T2	
37.	Formation of PDE by elimination of arbitrary functions	1	04-04-2026		TLM1	CO2	T1,T2	
38.	Solving of PDE	1	06-04-2026		TLM1	CO2	T1,T2	
39.	Solving of PDE	1	07-04-2026		TLM1	CO2	T1,T2	
40.	Lagrange's Method	1	08-04-2026		TLM1	CO2	T1,T2	
41.	Lagrange's Method	1	09-04-2026		TLM1	CO2	T1,T2	
42.	Homogeneous Linear PDE with constant coefficients	1	11-04-2026		TLM1	CO2	T1,T2	
43.	Homogeneous Linear PDE with constant coefficients	1	13-04-2026		TLM1	CO2	T1,T2	
44.	TUTORIAL - V	1	15-04-2026					
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: Vector Differentiation

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
45.	Introduction to UNIT IV	1	16-04-2026		TLM1	CO3	T1,T2	
46.	Vector Differentiation	1	18-04-2026		TLM1	CO3	T1,T2	
47.	Gradient	1	20-04-2026		TLM1	CO3	T1,T2	
48.	Directional Derivative	1	21-04-2026		TLM1	CO3	T1,T2	

49.	TUTORIAL VI	1	22-04-2026		TLM1	CO3	T1,T2	
50.	Directional Derivative	1	23-04-2026		TLM1	CO3	T1,T2	
51.	Divergence	1	25-04-2026		TLM1	CO3	T1,T2	
52.	Curl	1	27-04-2026		TLM1	CO3	T1,T2	
53.	Solenoidal fields, Irrotational fields, potential surfaces	1	28-04-2026		TLM1	CO3	T1,T2	
54.	TUTORIAL VII	1	29-04-2026		TLM3	CO3	T1,T2	
55.	Solenoidal fields, Irrotational fields, potential surfaces	1	30-04-2026		TLM1	CO3	T1,T2	
56.	Laplacian, second order operators	1	02-05-2026		TLM1	CO3	T1,T2	
57.	Vector Identities	1	04-05-2026		TLM1	CO3	T1,T2	
58.	Vector Identities	1	05-05-2026		TLM1	CO3	T1,T2	
59.	Vector Identities	1	06-05-2026		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
57.	Introduction to Unit-V	1	07-05-2026		TLM1	CO4	T1,T2	
58.	Line Integral	1	09-05-2026		TLM1	CO4	T1,T2	
59.	Circulation	1	11-05-2026		TLM1	CO4	T1,T2	
60.	Work done	1	12-05-2026		TLM1	CO4	T1,T2	
61.	TUTORIAL -VIII	1	13-05-2026		TLM3	CO4	T1,T2	
62.	Surface Integral	1	14-05-2026		TLM1	CO4	T1,T2	
63.	Surface Integral	1	16-05-2026		TLM1	CO4	T1,T2	
64.	Flux	1	01-06-2026		TLM1	CO4	T1,T2	
65.	Green's Theorem	1	02-06-2026		TLM1	CO4	T1,T2	
66.	TUTORIAL - IX	1	03-06-2026		TLM3	CO4	T1,T2	
67.	Green's Theorem	1	04-06-2026		TLM1	CO4	T1,T2	
68.	Stoke's Theorem	1	06-06-2026		TLM1	CO4	T1,T2	
69.	Divergence Theorem	1	08-06-2026		TLM1	CO4	T1,T2	
70.	Divergence Theorem	1	09-06-2026		TLM1	CO4	T1,T2	
71.	TUTORIAL - X	1	10-06-2026		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-V		15			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
72.	Non-homogeneous Linear PDE with constant coefficients	2	11-06-2026 13-06-2026		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			

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

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

PART-CEVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

Dr. T. Radha Rani	**Dr. K. Jhansi Rani**	**Dr. A. Rami Reddy**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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

COURSEHANDOUT

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

ACADEMICYEAR : 2025-26

COURSENAME&CODE : Engineering Workshop, 20ME51

L-T-PSTRUCTURE : 0-0-3

COURSECREDITS : 1.5

COURSEINSTRUCTOR : Dr.B.Sudheer Kumar, Sr. Assistant Professor
Mr.S. Srinivasa Reddy, Sr. Assistant Professor

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

COURSEOBJECTIVE:

The objective of this course is to get familiar 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, Dovetail 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.

COURSEARTICULATIONMATRIX(Correlation between Cos &POs, PSOs):

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSONPLAN):(BATCH-A1)

S.No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction Program	3	04-02-2026		TLM8	-	
2.	Demonstration	3	04-02-2026		TLM8	R1	
3.	Experiment-1	3	11-02-2026		TLM8	R1	
4.	Experiment-2	3	18-02-2026		TLM8	R1	
5.	Experiment-3	3	25-02-2026		TLM8	R1	
6.	Experiment-4	3	11-03-2026		TLM8	R1	
I-Mid Examinations (23-03-2026 to 28-03-2026)							
7.	Experiment-5	3	18-03-2026		TLM8	61	
8.	Experiment-6	3	01-04-2026		TLM8	R1	
9.	Experiment-7	3	08-04-2026		TLM8	R1	
10.	Experiment-8	3	15-04-2026		TLM8	R1	
11.	Experiment-9	3	22-04-2026		TLM8	R1	
12.	Repetition lab	3	29-04-2026		TLM8	--	
13.	Lab Internal	3	13-05-2026		TLM6	--	

COURSE DELIVERY PLAN (LESSONPLAN):(BATCH-A2)

S. No.	Experiment to be conducted	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Reference	HOD Sign Weekly
1.	Induction Program	3	04-02-2026		TLM8	-	
2.	Demonstration	3	04-02-2026		TLM8	R1	
3.	Experiment-1	3	11-02-2026		TLM8	R1	
4.	Experiment-2	3	18-02-2026		TLM8	R1	
5.	Experiment-3	3	25-02-2026		TLM8	R1	
6.	Experiment-4	3	11-03-2026		TLM8	R1	
I-Mid Examinations (23-03-2026 to 28-03-2026)							
7.	Experiment-4	3	18-03-2026		TLM8	R1	
8.	Experiment-5	3	01-04-2026		TLM8	61	
9.	Experiment-6	3	08-04-2026		TLM8	R1	
10.	Experiment-7	3	15-04-2026		TLM8	R1	
11.	Experiment-8	3	22-04-2026		TLM8	R1	
12.	Experiment-9	3	29-04-2026		TLM8	R1	
13.	Repetition lab	3	06-05-2026		TLM8	--	
14.	Lab Internal	3	13-05-2026		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	02-02-2026	31-03-2026	7W
I Mid Examinations	23-03-2026	28-03-2026	1W
II Phase of Instructions	30-03-2026	16-05-2026	7W
II Mid Examinations	15-06-2026	20-06-2026	1W
Preparation and Practical's	22-06-2026	27-06-2026	1W
Semester End Examinations	29-06-2026	11-07-2026	2W

Part-C

EVALUATIONPROCESS:

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
TotalMarks:A1+B1+C1+D1	100Marks

Details of Batches: A-SEC

Batch No.	Reg. No.of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
A11	25761A05CY-05DF	8	A21	25761A05EC-05EJ	8
A12	25761A05DG-05DM	7	A22	25761A05EK-05ER	8
A13	25761A05DN-05DU	8	A23	25761A05ES-05EY	7
A14	25761A05DV-05EB	7	A24	25761A05EZ-05FF	7

Batch No:	Exp. 01	Exp. 02	Exp. 03	Exp. 04	Exp. 05	Exp. 06	Exp. 07	Exp. 08	Exp. 09
A11	F1	F2	P1	P2	C1	C2	E1	E2	T1
A12	F2	F1	P2	P1	C2	C1	E2	E1	T1
A13	P1	P2	C1	C2	E1	E2	F1	F2	T1
A14	P2	P1	C2	C1	E2	E1	F2	F1	T1
A21	C1	C2	E1	E2	F1	F2	P1	P2	T1
A22	C2	C1	E2	E1	F2	F1	P2	P1	T1
A23	E1	E2	F1	F2	P1	P2	C1	C2	T1
A24	E2	E1	F2	F1	P2	P1	C2	C1	T1

LIST OF EXPERIMENTS:

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

NOTIFICATION OF CYCLE:

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

PROGRAMME EDUCATIONAL OBJECTIVES:

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

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

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

PROGRAM OUT COMES (POs)

Engineering Graduates will be able to :

1. **Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and 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 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. **Engineering and Society**: Apply reasoning informed by contextual knowledge to assess societal, health, safety, legal and cultural issues, and the consequent responsibilities relevant to professional engineering practice.
7. **Environment and sustainability**: Understand the impact of professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
8. **Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of engineering practice.
9. **Individual and teamwork**: Function effectively as an individual, and as a member or leader in diverse teams, and in multi-disciplinary settings.
10. **Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and giving and receive clear instruction

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructors	**Course Coordinator**	**Module Coordinator**	**HOD**
Dr. B.Sudheer Kumar **Mr. Srinivasa Reddy**	**Mr. Seelam.Srinivasa Reddy**	**Mr. J.Subba Reddy**	**Dr. M. B. S Sreekara Reddy**