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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. R. Padma Venkat
Course Name & Code : Communicative English & 23FE01
L-T-P Structure : **3-0-0** **Credits:** 02
Program/Sem/Sec : B. Tech, I Sem. ME.
A.Y. : 2025-26

PREREQUISITE : **NIL**

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The main objective of introducing this course, *Communicative English,* is to facilitate effective Listening, Reading, Speaking and Writing skills among the students. It enhances the same in their comprehending abilities, oral presentations, reporting useful information and providing knowledge of grammatical structures and vocabulary. This course helps the students to make them effective in speaking and writing skills and to make them industry ready.

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

CO1	Understand the context, topic, and pieces of specific information from social or Transactional dialogues.	L2
CO2	Apply grammatical structures to formulate sentences and correct word forms.	L3
CO3	Use discourse markers to speak clearly on a specific topic in informal discussions.	L3
CO4	Read / Listen the texts and write summaries based on global comprehension of these texts.	L2
CO5	Prepare a coherent paragraph, essay, and resume.	L3

COURSE ARTICULATION MATRIX (Correlation between COs & POs)

Course Outcomes / PO's →	Programme Outcomes											
	1	2	3	4	5	6	7	8	9	10	11	12
CO1.	-	-	-	1	-	-	-	-	3	3	-	2
CO2.	-	-	-	1	-	-	-	-	3	3	-	2
CO3.	-	-	-	1	-	-	-	-	3	3	-	2
CO4.	-	-	-	1	-	-	-	-	3	3	-	2
CO5.	-	-	-	1	-	-	-	-	3	3	-	2
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	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Bridge Course	2 Weeks	04-08-2025 TO 16-08-2025		TLM1	CO1		
2.	Introduction to the course				TLM1	CO1		
3.	Course Outcomes, Program Outcomes				TLM2	CO1		

UNIT-I:

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.	**Human Values: Gift of Magi.**	04	18-8-25 19-5-25 25-8-25 26-8-25		TLM1 TLM 6	CO1	T1,T2	
2.	**Skimming to get main idea; Scanning for specific pieces of information.**	01	30-8-25		TLM2 TLM5	CO1	T1,T2	
3.	**Mechanics of Writing: Capitalization, Spelling, Punctuation**	01	1-9-25		TLM1 TLM6 TLM5	CO1	T1,T2	
4.	**Parts of speech**	01	2-9-25		TLM2 TLM6	CO1	T1,T2	
5.	**Basic Sentence Structures & Forming questions.**	01	6-9-25		TLM2 TLM6	CO1	T1,T2	
6.	**Synonyms, Antonyms, Affixes & Root Words.**	02	8-9-25 9-9-25		TLM2 TLM5	CO1	T1,T2	
No. of classes required to complete UNIT-I: 10						**No. of classes taken:**		

UNIT-II:

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.	**Nature: The Brook by Alfred Tennyson**	03	15-9-25 16-9-25 20-9-25		TLM1 TLM 6	CO2	T1,T2	
2.	**Identifying Sequence of ideas, Linking ideas into a Paragraph**	01	22-9-25		TLM2 TLM5	CO2	T1,T2	
3.	**Structure of Paragraph – Paragraph Writing**	01	23-9-25		TLM1 TLM6 TLM5	CO2	T1,T2	
4.	**Cohesive Devices-**	02	27-9-25		TLM2	CO2	T1,T2	

	linkers		6-10-25		TLM6			
5.	**Use of Articles, zero article & Prepositions**	02	7-10-25 13-10-25		TLM2 TLM6	CO2	T1,T2	
6.	**Homophones, Homographs, Homonyms**	02	14-10-25		TLM2 TLM6	CO2	T1,T2	
No. of classes required to complete UNIT-II: 11						**No. of classes taken:**		

UNIT-III:

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.	**Biography: Elon Musk**	02	27-10-25 28-10-25		TLM1 TLM 6	CO3	T1,T2	
2.	**Reading and making basic inferences – recognizing and interpreting the text clues for comprehension**	01	1-11-25		TLM2 TLM5	CO3	T1,T2	
3.	**Summarizing, Note-making, Paraphrasing**	01	3-11-25		TLM1 TLM6 TLM5	CO3	T1,T2	
4.	**Verbs- Tenses & Subject-verb agreement**	03	4-11-25 10-11-25 11-11-25		TLM2 TLM6	CO3	T1,T2	
5.	**Compound words, Collocations**	02	15-11-25 17-11-25		TLM2 TLM5	CO3	T1,T2	
No. of classes required to complete UNIT-III: 09						**No. of classes taken:**		

UNIT-IV:

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.	**Inspiration: The Toys of Peace- by Saki**	02	18-11-25 22-11-25		TLM1 TLM 6	CO4	T1,T2	
2.	**Study of graphic elements in text to display complicated data**	01	24-11-25		TLM2 TLM5	CO4	T1,T2	
3.	**Letter Writing : Official Letters, Resumes**	02	25-11-25		TLM1 TLM6 TLM5	CO4	T1,T2	
4.	**Reporting verbs, Direct & Indirect Speech, Active & Passive voice**	02	1-12-25 2-12-25		TLM2 TLM6	CO4	T1,T2	

5.	**Words often confused, Jargon**	01	6-12-25		TLM2 TLM5	CO4	T1,T2	
No. of classes required to complete UNIT-IV: 08						**No. of classes taken:**		

UNIT-V:

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.	**Motivation: The Power of Interpersonal Communication**	02	8-12-25 9-12-25		TLM1 TLM 6	CO5	T1,T2	
2.	**Reading Comprehension**	02	15-12-25		TLM2 TLM5	CO5	T1,T2	
3.	**Structured Essays on specific topics**	01	20-12-25		TLM1 TLM6 TLM5	CO5	T1,T2	
4.	**Editing Texts – Correcting Common errors**	02	23-12-25		TLM2 TLM6	CO5	T1,T2	
5.	**Technical Jargon**	01	27-12-25		TLM2 TLM5	CO5	T1,T2	
No. of classes required to complete UNIT-V: 08						**No. of classes taken:**		

S. No.	Topics to be covered beyond the syllabus	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	**Word Analogy**	01	18-10-25		TLM2 &5	
2.	**One-word substitutes**	01	29-11-25		TLM2 &5	
3.	**Technical vocabulary**	01	16-12-25		TLM2 &5	
No. of classes required to complete:				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. R. Padma Venkat**	**Dr. R. Padma Venkat**	**Dr. R. Padma Venkat**	**Dr. T. Satyanarayana**
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PART-A

Course Name & Code : BASIC MECHANICAL ENGINEERING & 23CM01

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

Program/Sem/Sec : B.Tech/I/A **A.Y.:** 2024-25

Name of Course Coordinator : Dr. S.RAMI REDDY

Name Of Course Instructor : Dr. S.RAMI REDDY

Prerequisite Subject: Nil

Course Educational Objectives: The students after completing the course are expected to get familiarized with the scope and importance of Mechanical Engineering in different sectors and industries. Explain different engineering materials and different manufacturing processes. Provide an overview of different thermal and mechanical transmission systems and introduce basics of robotics and its applications.

Course Outcomes: After completion of the course students will be able to:

CO1	Summarize the different manufacturing processes. Remembering-L1)
CO2	Explain the basics of thermal engineering and its applications. (Understanding-L2)
CO3	Illustrate the working of different mechanical power transmission systems and power plants. (Understanding-L2)
CO4	Describe the basics of robotics and its applications. (Understanding-L2)

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO10	PO11	PO12	PSO 1	PS O2	PS O3
CO1	1	1	1											1	
CO2	1	1												1	
CO3	1	1												1	1
CO4	1	1												1	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 Internal Combustion Engines by V.Ganesan, By Tata McGraw Hill publications (India) Pvt. Ltd.

T2 A text book of Theory of Machines by S.S. Rattan, Tata McGraw Hill Publications, (India) Pvt. Ltd

T3 An introduction to Mechanical Engg by Jonathan Wicker and Kemper Lewis, Cengage learning India Pvt. Ltd

BOS APPROVED REFERENCE BOOKS:

R1 G. Shanmugam and M.S.Palanisamy, Basic Civil and the Mechanical Engineering, Tata McGraw Hill publications (India) Pvt. Ltd.

R2 Thermal Engineering by Mahesh M Rathore Tata McGraw Hill publications (India) Pvt. Ltd.

R3 3D printing & Additive Manufacturing Technology- L. Jyothish Kumar, Pulak M Pandey, Springer publications.

R4 Appuu Kuttan KK, Robotics, I.K. International Publishing House Pvt. Ltd. Volume-I

COURSE DELIVERY PLAN (LESSON PLAN): Section-B

UNIT-I: Introduction to Mechanical Engineering & Engineering 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
1.	Introduction to Introduction to Mechanical Engineering: - Course Educational Objective & Course Outcomes	01	29/10/2025		**TLM1**	CO1	T3,R6	
2.	Define Engineering, Role of Engineering.	01	30/10/2025		**TLM1**	CO1	T3,R6	
3.	Role of Mechanical Engineering in Industries and Society	01	01/11/2025		**TLM1**	CO1	T3	
4.	Technologies in different sectors such as Energy	01	03/11/2025		**TLM1**	CO1	T3	
5.	Technologies in different sectors such as Manufacturing	01	05/11/2025		**TLM1**	CO1	T3	
6.	Technologies in different sectors such as Automotive	01	06/11/2025		**TLM1**	CO1	T2,R1,R3	
7.	Technologies in different sectors such as Aerospace	01	07/11/2025		**TLM1**	CO1	T2,R1,R3	
8.	Technologies in different sectors such as Marine sectors	01	01/11/2025		**TLM1**	CO1	T3,R1	
9.	Engineering Materials	01	01/11/2025		**TLM1**	CO1	T2,R1	
10.	Metals-Ferrous and Non-ferrous,	01	10/11/2025		**TLM1**	CO1	T2,R1	
11.	Ceramics, Composites,	01	12/11/2025		**TLM1**	CO1	T2,R1	
12.	Smart materials	01	13/11/2025					
No. of classes required to complete UNIT-I		**12**			**No. of classes taken:**			
UNIT – II Manufacturing Processes &Thermal Engineering								
13.	Principles of Casting	01	17/11/2025		**TLM1**	CO2	T2,R1	
14.	Forming,	01	19/11/2025		**TLM1**	CO2	T2,R1	
15.	Joining processes,	01	20/11/2025		**TLM1**	CO2	T2,R1	
16.	Machining	01	22/11/2025		**TLM1**	CO2	T2,R1	
17.	Introduction to CNC machines	01	12/11/2025		**TLM1**	CO2	T2,R1	
18.	3D printing, and Smart manufacturing	01	24/11/2025		**TLM1**	CO2	T2,R1	

19.	Working principle of Boilers	01	26/11/2025		**TLM1**	CO2	T2,R1	
20.	Otto cycle, Diesel cycle	01	27/11/2025		**TLM1**	CO2	T2,R1	
21.	Refrigeration and air-conditioning cycles,	01	29/11/2025		**TLM1**	CO2	T2,R1	
22.	IC engines, 2-Stroke and 4-Stroke engines	01	01/12/2025		**TLM1**	CO2	T2,R1	
23.	SI/CI Engines	01	03/12/2025		**TLM1**	CO2	-	
24.	Components of Electric and Hybrid Vehicles.	01	04/12/2025		**TLM1**	CO2	-	
No. of classes required to complete UNIT-II		**12**			**No. of Classes taken:**			

UNIT-III: Power plants, Mechanical Power Transmission, Introduction to Robotics

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
25.	Working principle of Steam	01	06/12/2025		**TLM1**	CO3	T2,R6	
26.	Diesel, Hydro	01	08/12/2025		**TLM1**	CO3	T2,R6	
27.	Nuclear power plants	01	10/12/2025		**TLM1**	CO3	T1,T2,R1	
28.	Belt Drives, Chain	01	11/12/2025		**TLM1**	CO3	T1,T2,R1	
29.	Rope drives,	01	15/12/2025		**TLM1**	CO3	-	
30.	Gear Drives and their applications.	01	17/12/2025		**TLM1**	CO3	-	
31.	Gear Drives and their applications.	01	18/12/2025		**TLM1**	CO3	T2,R1	
32.	Joints & links	01	20/12/2025		**TLM1**	CO3	T2,R1	
33.	Joints & links	01	22/12/2025		**TLM1**	CO3	T2,R1	
34.	Joints & links	01	24/12/2025		**TLM1**	CO3	T2,R1	
35.	configurations	01	27/12/2025		**TLM1**	CO3	T2,R1	
36.	Applications of robotics.	01	29/12/2025		**TLM1**	CO3	T2,R1	
37.	Applications of robotics.	01	31/12/2025		**TLM1**	CO3	T2,R1	
No. of classes required to complete UNIT-III		**13**			**No. of classes taken:33**			

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	18/08/2025	27/09/2025	6
I Mid Examinations	20/10/2025	25/10/2025	1

II Phase of Instructions	27/10/2025	27/12/2025	9
II Mid Examinations	29/12/2025	03/01/2026	1
Preparation and Practical	05/01/2026	10/01/2026	1
Semester End Examinations	19/01/2026	31/01/2026	2

EVALUATION PROCESS:

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Dr.S.RAMI REDDY**	**Dr.S.RAMI REDDY**	**Dr.M.B.S.S.Reddy**	**Dr.M.B.S.S.Reddy**
Signature				

FRESHMANENGINEERINGDEPARTMENT

COURSEHANDOUT

PART-A

PROGRAM:	**I B.Tech., I-Sem., ME**
ACADEMIC YEAR:	**2025-26**
COURSENAME &CODE:	**ENGINEERING PHYSICS**
L-T-PSTRUCTURE:	**4-0-0**
COURSECREDITS:	**3**
COURSEINSTRUCTOR:	**P VIJAYA SIRISHA**
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 (**Understand)**
CO4	Explain fundamentals of quantum mechanics and free electron theory of metals (**Understand**)
CO5	he 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	19-08-2025		**TLM-2**		
2	Principle of superposition, Interference of light	1	21-08-2025		**TLM-1**		
3	Interference in thin films by reflection & applications	1	22-08-2025		**TLM-2**		
4	Colors in thin films, Newton's rings	1	22-08-2025		**TLM-1**		
5	Determination of wavelength and refractive index	1	26-08-2025		**TLM-1**		
6	Problems& Assignment/Quiz	1	28-08-2025		**TLM-1**		
7	Introduction, Fresnel and	1	29-08-2025		**TLM-3**		

	Fraunhoffer diffractions						
8	Fraunhoffer diffraction due to single slit	1	29-08-2025		**TLM-2**		
9	Double slit& N slits(Qualitative)	1	02-09-2025		**TLM-2**		
10	Tutorial	1	04-09-2025		**TLM-3**		
11	Diffraction Grating, Dispersive power & Resolving power of Grating-Qualitative	1	05-09-2025		**TLM-1**		
12	Introduction – Types of polarization	1	05-09-2025		**TLM-2**		
13	Polarization by reflection, refraction & double refraction	1	09-09-2025		**TLM-2**		
14	Tutorial	1	11-09-2025		**TLM-1**		
15	Nicol's prism	1	12-09-2025		**TLM-2**		
16	Half wave and Quarter wave plates	1	12-09-2025		**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	16-09-2025		**TLM-2**		
2	Tutorial	1	18-09-2025		**TLM-2**		
3	Crystal Systems(3D)	1	19-09-2025		**TLM-2**		
4	Bravais Lattices	1	19-09-2025		**TLM-1**		
5	Coordination number – Packing fraction of –SC, BCC	1	23-09-2025		**TLM-1**		
6	Tutorial	1	25-09-2025		**TLM-3**		
7	Coordination number – Packing fraction of FCC	1	26-09-2025		**TLM-1**		

8	Miller indices& Properties	1	26-09-2025		**TLM-3**		
9	Miller indices Sketching planes	1	07-10-2025		**TLM-2**		
10	Tutorial	1	09-10-2025		**TLM-2**		
11	Separation between successive (hkl) planes	1	10-10-2025		**TLM-1**		
12	Bragg's law;	1	10-10-2025		**TLM-2**		
13	X–ray Diffractometer		14-10-2025				
14	Tutorial	1	16-10-2025		**TLM-3**		
15	Crystal Structure determination by Laue's method	1	17-10-2025		**TLM-1**		
16	Crystal Structure determination by Powder method	1	17-10-2025		**TLM-1**		
No.of classes required to complete UNIT-II: 16				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	28-10-2025		**TLM-2**		
2	Tutorial	1	30-10-2025		**TLM-3**		
3	Types of polarizations-Electronic polarization	1	31-10-2025		**TLM-1**		
4	Ionic & orientation polarizations (Qualitative)	1	31-10-2025		**TLM-1**		
5	Lorentz internal field	1	04-11-2025		**TLM-2**		
6	Tutorial	1	06-11-2025		**TLM-3**		
7	Claussius-Mosotti equation, Complex dielectric constant	1	07-11-2025		**TLM-2**		
8	Frequency dependence of	1	07-11-2025		**TLM-1**		

	polarization dielectric loss						
9	Introduction Magnetic dipole moment and basic defnitions	1	11-11-2025		**TLM-1**		
10	Tutorial	1	13-11-2025		**TLM-3**		
11	Atomic origin of magnetism	1	14-11-2025		**TLM-2**		
12	Classification of magnetic materials- Dia, para, Ferro, anti-ferro & Ferri magnetic materials	1	14-11-2025		**TLM-2**		
13	Domain concept for Ferromagnetism & Domain walls	1	18-11-2025		**TLM-1**		
14	Hysteresis	1	20-11-2025		**TLM-1**		
15	soft and hard magnetic materials	1	21-11-2025		**TLM-1**		
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	21-11-2025		**TLM-2**		
2	Heisenberg's Uncertainty Principle	1	25-11-2025		**TLM-2**		
3	Tutorial	1	27-11-2025		**TLM-3**		
4	Significance & properties of wave function	1	28-11-2025		**TLM-1**		
5	Schrodinger's time independent and dependent wave equations	1	28-11-2025		**TLM-1**		
6	Particle in a one – dimensional infinite potential well	1	02-12-2025		**TLM-1**		
7	Classical free electron theory-merits and demerits,	1	04-12-2025		**TLM-2**		
8	Quantum free electron theory Electrical conductivity based	1	05-12-2025		**TLM-1**		

	on quantum free						
9	Fermi -Dirac distribution and temperature dependence	1	05-12-2025		**TLM-1**		
10	Density of states, Fermi energy	1	09-12-2025		**TLM-1**		
11	Tutorial	1	11-12-2025		**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	12-12-2025		**TLM-1**		
2	Intrinsic semiconductors, Density of charge carriers	1	12-12-2025		**TLM-1**		
3	Electrical conductivity, Fermi level	1	16-12-2025		**TLM-2**		
4	Tutorial	1	18-12-2025		**TLM-3**		
5	Extrinsic semiconductors, Density of charge carriers	1	19-12-2025		**TLM-2**		
6	Dependence of Fermi energy on carrier concentration &temperature	1	19-12-2025		**TLM-1**		
7	Drift and Diffusion Currents, Einstein's equation	1	23-12-2025		**TLM-1**		
8.	Hall Effect & its applications	1	26-12-2025		**TLM-1**		
9	Revision	1	26-12-2025		**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.

CourseInstructor	Course Coordinator	ModuleCoordinator	HOD
P Vijaya Sirisha	**Dr.S.Yusuf**	**Dr.S.Yususf**	**Dr.T.Sathyanarayana**

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

COURSE HANDOUT

Part-A

PROGRAM	**:** I B. Tech., I-Sem., ME
ACADEMIC YEAR	**:** 2025-26
COURSE NAME & CODE	**:** Linear Algebra & Calculus
L-T-P STRUCTURE	**:** 4-1-0
COURSE CREDITS	**:** 3
COURSE INSTRUCTOR	**:** Dr. K. R. Kavitha
COURSE COORDINATOR	**:** Dr. K. Bhanu Lakshmi
PRE-REQUISITES	**:** Basics of Matrices**,** Differentiation, Integration

COURSE EDUCATIONAL OBJECTIVES (CEOs): To equip the students with standard concepts and tools at an intermediate to advanced level mathematics, to develop the confidence and ability among the students to handle various real-world problems and their applications.

COURSE OUTCOMES (COs)

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

CO1: Apply matrix algebra techniques to solve engineering problems – **L3**

CO2: Use Eigen values and Eigen vectors concept to find nature of quadratic form, inverse and powers of matrix – **L3**

CO3: Expand various functions using Mean value theorems – **L2**

CO4: Understand the concepts of functions of several variables which are useful in optimization – **L2**

CO5: Evaluate areas and volumes by using double and triple integrals – **L3**

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	-	-	-	-	-	-	-	-	1
CO2	3	2	-	-	-	-	-	-	-	-	-	1
CO3	3	1	-	-	-	-	-	-	-	-	-	1
CO4	3	2	-	-	-	-	-	-	-	-	-	1
CO5	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 R.K. Jain and S.R.K. Iyengar, "*Advanced Engineering Mathematics*", 5th Edition (9th reprint), Alpha Science International Ltd., 2021.

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

R4 Michael D.Greenberg, "*Advanced Engineering Mathematics*", 9th Edition, Pearson Publishers.
R5 H.K. Das, Er. Rajnish Verma, "*Higher Engineering Mathematics*", 3rd Edition (Reprint 2021), S. Chand Publications, 2014.

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.	Bridge Course	8	04-08-2025 TO 16-08-2025	04-08-2025 TO 16-08-2025	TLM1			
2.	Introduction to the course	1	18-08-2025		TLM1			
3.	Course Outcomes, Program Outcomes	1	19-08-2025		TLM2			

UNIT-I: Matrices

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
4.	Introduction to Unit I, Matrices	1	21-08-2025		TLM1	CO1	T1,T2	
5.	Rank of a matrix	1	22-08-2025		TLM1	CO1	T1,T2	
6.	Echelon form	1	23-08-2025		TLM1	CO1	T1,T2	
7.	Normal form	1	25-08-2025		TLM1	CO1	T1,T2	
8.	**TUTORIAL 1**	1	26-08-2025		TLM3	CO1	T1,T2	
9.	Cauchy-Binet formulae	1	28-08-2025		TLM1	CO1	T1,T2	
10.	Inverse by Gauss-Jordan method	1	29-08-2025		TLM1	CO1	T1,T2	
11.	System of Linear Equations	1	30-10-2025		TLM1	CO1	T1,T2	
12.	Homogeneous System of Equations	1	01-09-2025		TLM1	CO1	T1,T2	
13.	**TUTORIAL 2**	1	02-09-2025		TLM3	CO1	T1,T2	
14.	Homogeneous System of Equations	1	04-09-2025		TLM1	CO1	T1,T2	
15.	Non-Homogeneous System of Equations	1	06-09-2025		TLM1	CO1	T1,T2	
16.	Non-Homogeneous System of Equations	1	08-09-2025		TLM1	CO1	T1,T2	
17.	**TUTORIAL 3**	1	09-09-2025		TLM1	CO1	T1,T2	
18.	Gauss Elimination Method	1	11-09-2025		TLM1	CO1	T1,T2	
19.	Jacobi Iteration Method	1	12-09-2025		TLM3	CO1	T1,T2	
20.	Gauss-Seidel Method	1	15-09-2025		TLM1	CO1	T1,T2	
21.	**TUTORIAL 4**	1	16-09-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I : 18					No. of classes taken:			

UNIT-II: Eigen Values, Eigen Vectors and Orthogonal Transformations

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
22.	Introduction to Unit II	1	18-09-2025		TLM1	CO2	T1,T2	
23.	Eigen values, Eigen vectors	1	19-09-2025		TLM1	CO2	T1,T2	
24.	Eigen values, Eigen vectors	1	20-09-2025		TLM1	CO2	T1,T2	
25.	Properties	1	22-09-2025		TLM1	CO2	T1,T2	

26.	**TUTORIAL 5**	1	23-09-2025		TLM3	CO2	T1,T2	
27.	Cayley-Hamilton Theorem	1	25-09-2025		TLM1	CO2	T1,T2	
28.	Finding Inverse and Powers of matrix	1	26-09-2025		TLM1	CO2	T1,T2	
29.	Diagonalisation of a matrix	1	27-09-2025		TLM1	CO2	T1,T2	
30.	Diagonalisation of a matrix	1	06-10-2025		TLM1	CO2	T1,T2	
31.	**TUTORIAL 6**	1	07-10-2025		TLM1	CO2	T1,T2	
32.	Quadratic Forms	1	09-10-2025		TLM1	CO2	T1,T2	
33.	Nature of Quadratic Forms	1	10-10-2025		TLM1	CO2	T1,T2	
34.	Reduction of Quadratic form to Canonical form	1	11-10-2025		TLM1	CO2	T1,T2	
35.	Reduction of Quadratic form to Canonical form	1	13-10-2025		TLM1	CO2	T1,T2	
36.	**TUTORIAL 7**	1	14-10-2025		TLM1	CO2	T1,T2	
37.	Orthogonal Transformation	1	16-10-2025		TLM1	CO2	T1,T2	
38.	Orthogonal Transformation	1	17-10-2025		TLM1	CO2	T1,T2	
39.	Revision	1	18-10-2025					
No. of classes required to complete UNIT-II: 18					No. of classes taken:			

I MID EXAMINATIONS (20-10-2025 TO 25-10-2025)

UNIT-III: Calculus

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
40.	Introduction to Unit III	1	27-10-2025		TLM1	CO3	T1,T2	
41.	Mean Value theorem	1	28-10-2025		TLM1	CO3	T1,T2	
42.	Rolle's theorem	1	30-10-2025		TLM1	CO3	T1,T2	
43.	Rolle's theorem	1	31-10-2025		TLM1	CO3	T1,T2	
44.	Lagrange's mean value theorem	1	01-11-2025		TLM1	CO3	T1,T2	
45.	Lagrange's mean value theorem	1	03-11-2025		TLM1	CO3	T1,T2	
46.	**TUTORIAL 8**	1	04-11-2025		TLM3	CO3	T1,T2	
47.	Cauchy's mean value theorem	1	06-11-2025		TLM1	CO3	T1,T2	
48.	Taylor's theorem	1	07-11-2025		TLM1	CO3	T1,T2	
49.	Taylor's theorem	1	10-11-2025		TLM1	CO3	T1,T2	
50.	**TUTORIAL 9**	1	11-11-2025		TLM3	CO3	T1,T2	
51.	Maclaurin's theorem	1	13-11-2025		TLM1	CO3	T1,T2	
52.	Problems and applications	1	14-11-2025		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		13			No. of classes taken:			

UNIT-IV: Partial differentiation and Applications (Multi variable Calculus)

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

53.	Introduction to Unit IV	1	15-11-2025		TLM1	CO4	T1,T2	
54.	Functions of several variables.	1	17-11-2025		TLM1	CO4	T1,T2	
55.	Continuity and Differentiability	1	18-11-2025		TLM1	CO4	T1,T2	
56.	Partial Derivatives	1	21-11-2025		TLM1	CO4	T1,T2	
57.	Total derivatives, Chain rule, Directional Derivative	1	22-11-2025		TLM1	CO4	T1,T2	
58.	Taylor's Series expansion	1	24-11-2025		TLM1	CO4	T1,T2	
59.	**TUTORIAL 10**	1	25-11-2025		TLM3	CO4	T1,T2	
60.	Maclaurin's series expansion	1	27-11-2025		TLM1	CO4	T1,T2	
61.	Jacobian	1	28-11-2025		TLM1	CO4	T1,T2	
62.	Functional Dependence	1	29-11-2025		TLM1	CO4	T1,T2	
63.	Maxima and Minima	1	01-12-2025		TLM1	CO4	T1,T2	
64.	**TUTORIAL 11**	1	02-12-2025		TLM3	CO4	T1,T2	
65.	Maxima and Minima	1	04-12-2025		TLM1	CO4	T1,T2	
66.	Lagrange Multiplier Method	1	05-12-2025		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		14			No. of classes taken:			

UNIT-V: Multiple Integrals (Multi variable Calculus)

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
67.	Introduction to Unit-V	1	06-12-2025		TLM1	CO5	T1,T2	
68.	Double Integrals - Cartesian coordinates	1	08-12-2025		TLM1	CO5	T1,T2	
69.	Double Integrals - Cartesian coordinates	1	09-12-2025		TLM1	CO5	T1,T2	
70.	Double Integrals- Polar co ordinates	1	11-12-2025		TLM1	CO5	T1,T2	
71.	Triple Integrals - Cartesian coordinates	1	12-12-2025		TLM1	CO5	T1,T2	
72.	Triple Integrals - Spherical coordinates	1	15-12-2025		TLM1	CO5	T1,T2	
73.	**TUTORIAL 12**	1	16-12-2025		TLM3	CO5	T1,T2	
74.	Change of order of Integration	1	18-12-2025		TLM1	CO5	T1,T2	
75.	Change of order of Integration	1	19-12-2025		TLM1	CO5	T1,T2	
76.	Change of variables	1	20-12-2025		TLM1	CO5	T1,T2	
77.	Finding area by double Integral	1	22-12-2025		TLM1	CO5	T1,T2	
78.	**TUTORIAL 13**	1	23-12-2025		TLM3	CO5	T1,T2	
79.	Finding Volume by double and triple Integral	1	25-12-2025		TLM1	CO5	T1,T2	
80.	Revision	1	26-12-2025					

No. of classes required to complete UNIT-V	14	No. of classes taken:

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
81.	Other applications of double integral	1	27-12-2025		TLM2	CO5	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (16-12-2024 TO 21-12-2024)								

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

PART-C

EVALUATION PROCESS (R20 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. R. KAVITHA	**Dr. K. BHANU LAKSHMI**	**Dr. A. RAMI REDDY**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I),
ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931
DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor(s): **Mr. Jonnala Subba Reddy (T668),**
Dr. V. Dhana Raju (T405), Mr. V. Shankara Rao (T721)

Course Name & Code	**:** Engineering Graphics – 23ME01	**Regulations**	**:** R23
L-T-P Structure	**:** 2 – 0 - 4	**Credits**	**:** 03
Program /Sem /Sec	: B.Tech/ I SEM MECH - 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	19-08-2025		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	21-08-2025		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	26-08-2025		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	28-08-2025		TLM 1, 2, 3	**CO 1**	**T1, R1 to R5**	
05	Construction of Cycloids, Involutes, Normal and Tangent to Curves, Practice	2	02-09-2025		TLM 1, 2	**CO 1**	**T1, R1 to R5**	
06	**Orthographic Projections**: Reference plane, importance of reference lines or Plane, Practice	3	04-09-2025		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	09-09-2025		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	11-09-2025		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	16-09-2025		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	18-09-2025		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
11	Projections of Straight Line Inclined to both the reference planes, Practice	2	22-09-2025		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	24-09-2025		TLM 1, 2, 3	**CO 2**	**T1, R1 to R5**	
13	Projections of planes inclined to both the reference planes, Practice	2	07-10-2025		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
14	Practice	3	09-10-2025		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
15	Practice	2	14-10-2025		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
16	Practice	3	16-10-2025		TLM 1, 2	**CO 2**	**T1, R1 to R5**	
-	**I Mid Examinations: From 20-10-2025 to 25-10-2025 (Covered CO 1 & CO 2)**							
No. of classes required to complete UNIT - II: 20 (Lectures: 08, Practice: 12)			**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
17	Types of solids: Polyhedra and Solids of revolution. Projections of solids in simple positions: Axis perpendicular to HP, Practice	2	28-10-2025		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
18	Projections of solids in simple positions: Axis perpendicular to vertical plane and Axis parallel to both the reference planes	3	30-10-2025		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
19	Projection of Solids with axis inclined to one reference plane and parallel to another plane, Practice	2	04-11-2025		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
20	Numericals	3	06-11-2025		TLM 1, 2	**CO 3**	**T1, R1 to R5**	
21	Practice	2	11-11-2025		TLM 1, 2, 3	**CO 3**	**T1, R1 to R5**	
22	Practice	3	13-11-2025		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
23	Introduction to Sections of Solids and Development of Surfaces: Perpendicular and inclined section planes	2	18-11-2025		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
24	Sectional views and True shape of section, Practice	3	20-11-2025		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
25	Sections of solids in simple position only, Numericals	2	25-11-2025		TLM 1, 2	**CO 4**	**T1, R1 to R5**	
26	**Development of Surfaces:** Introduction to Methods of Development of Surfaces, Parallel Line Development (Plane Surfaces), Practice	3	27-11-2025		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	

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	Radial Line Development, Numericals	2	02-12-2025		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
28	Practice	3	04-12-2025		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
29	Practice	2	09-12-2025		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
30	Practice	3	11-12-2025		TLM 1, 2, 3	**CO 4**	**T1, R1 to R5**	
No. of classes required to complete UNIT - IV: 20 (Lecture: 08, Practice: 12)			**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
31	Introduction to Isometric Views, Conversion of Views: Conversion of isometric views to orthographic views; Conversion of orthographic views to isometric views	2	16-12-2025		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
32	Practice	3	18-12-2025		TLM 1, 2, 3	**CO 5**	**T1, R1 to R5**	
33	**Computer Graphics**: Creating 2D&3D drawings of objects, including PCB and Transformations using Auto CAD	2	23-12-2025		TLM 1, 2	**CO 5**	**T1, R1 to R5**	
34	Practice	3	25-12-2025		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):**					
II Mid Examinations: From 29-12-2025 to 03-01-2026 (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 - I Semester (R23):

Commencement of Class work		**04-08-2025**	
Description	**From**	**To**	**Weeks**
Induction Program (Zero Semester)	**04-08-2025**	**16-08-2025**	**2 Weeks**
I Phase of Instructions	18-08-2025	27-09-2025	6 Weeks
Dasara Holidays	29-09-2025	04-10-2025	1 Week
I Phase of Instructions (Continued)	06-10-2025	18-10-2025	2 Weeks
I Mid Examinations	20-10-2025	25-10-2025	1 Week
II Phase of Instructions	27-10-2025	27-12-2025	9 Weeks
II Mid Examinations	29-12-2025	03-01-2026	1 Week
Preparation and Practicals	05-01-2026	10-01-2026	1 Week
Sankranti Holidays	12-01-2026	17-01-2026	1 Week
Semester End Examinations	19-01-2026	31-01-2026	2 Weeks
Commencement of Next (II) Semester Class Work		**02-02-2026**	

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**			
Tuesday		**Engineering Graphics**					
Wednesday							
Thursday					**Engineering Graphics**		
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: 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 multidisciplinary activities.

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

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: 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.

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

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I) & ISO 9001:2015 Certified Institution
Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: M. Manoj kumar

Course Name & Code : Basic Civil and Mechanical Engineering & 23CM01

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

Program/Sem/Sec : B.Tech., I-I-Sem., Mechanical **A.Y.:** 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- Get familiarized with the scope and importance of Civil Engineering sub-divisions.
- Introduce the preliminary concepts of surveying.
- Acquire preliminary knowledge on Transportation and its importance in nation's economy.
- Get familiarized with the importance of quality, conveyance and storage of water.
- Introduction to basic civil engineering materials and construction techniques.

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

CO1:	Describe various sub-divisions of Civil Engineering and to appreciate their role in societal development. **(Understand)**
CO2:	Outline the concepts of surveying and obtain the theoretical measurement of distances, angles and levels through surveying. **(Understand)**
CO3:	Classify the various materials used in construction and highway engineering and identify their appropriate usage as per the needs. **(Understand)**
CO4:	Illustrate the fundamental principles involved in transportation network system, their individual components and their engineering importance. **(Understand)**
CO5:	Explain the quality parameters of various water sources and functions of selected water storage and conveyance structures. **(Understand)**

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

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

Textbooks:

1. Basic Civil Engineering, M.S.Palanisamy, , Tata Mcgraw Hill publications (India) Pvt. Ltd. Fourth Edition.
2. Introduction to Civil Engineering, S.S. Bhavikatti, New Age International Publishers. 2022. First Edition.
3. Basic Civil Engineering, Satheesh Gopi, Pearson Publications, 2009, First Edition.

Reference Books:

1. Surveying, Vol- I and Vol-II, S.K. Duggal, Tata McGraw Hill Publishers 2019. Fifth Edition.
2. Hydrology and Water Resources Engineering, Santosh Kumar Garg, Khanna Publishers, Delhi. 2016
3. Irrigation Engineering and Hydraulic Structures - Santosh Kumar Garg, Khanna Publishers, Delhi 2023. 38th Edition.
4. Highway Engineering, S.K.Khanna, C.E.G. Justo and Veeraraghavan, Nemchand and Brothers Publications 2019. 10th Edition.
5. Indian Standard DRINKING WATER — SPECIFICATION IS 10500-2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Basics of Civil Engineering

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to CO's & PO's, Subject	1	18-08-2025		**TLM2**	
2.	**Basics of Civil Engineering:** Role of Civil Engineers in Society	1	20-08-2025		**TLM2**	
3.	Various Disciplines of Civil Engineering- Structural Engineering-	1	21-08-2025		**TLM2**	
4.	Geo-technical Engineering-Transportation Engineering	1	23-08-2025		**TLM2**	
5.	Hydraulics and Water Resources Engineering	1	25-08-2025		**TLM2**	
6.	Environmental Engineering-Scope of each discipline - Building Construction and Planning-	1	28-08-2025		**TLM2**	
7.	Construction Materials-Cement -types	1	30-08-2025		**TLM2**	
8.	Aggregate types- Bricks-classifications	1	01-09-2025		**TLM2**	
9.	Steel-properties - types Cement concrete- Applications	1	03-09-2025		**TLM2**	
10.	Introduction to Prefabricated construction Techniques, Over view-Prefabricated construction	1	04-09-2025		**TLM2**	
No. of classes required to complete UNIT-I: 10				**No. of classes taken:**		

UNIT-II: Surveying

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.	Objectives of Surveying, Horizontal Measurements	1	06-09-2025		**TLM2**	
2.	Angular Measurements, Compass survey	1	08-09-2025		**TLM2**	
3.	Introduction to Bearings,	1	10-09-2025		**TLM2**	
4.	Simple problems on bearings	1	11-09-2025		**TLM2**	
5.	Levelling introduction-	1	13-09-2025		**TLM2**	
6.	Practice problems	1	15-09-2025		**TLM2**	
7.	Levelling instruments used for levelling	1	17-09-2025		**TLM1**	
8.	Practice problems	1	18-09-2025		**TLM1**	
9.	Practice problems	1	20-09-2025		**TLM2**	
10.	Contour mapping	1	22-09-2025		**TLM2**	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-III: Transportation Engineering & Water Resources and Environmental Engineering

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.	Transportation Engineering Importance of Transportation in Nation's economic development	1	24-09-2025		**TLM2**	
2.	Types of Highway Pavements	1	25-09-2025		**TLM2**	
3.	Basics of Harbour, Tunnel	1	27-09-2025		**TLM2**	
4.	Basics of Airport, Railway Engineering	1	06-10-2025		**TLM2**	
5.	Water Resources and Environmental Engineering Introduction	1	08-10-2025		**TLM2**	
6.	Sources of water, Quality of water-Specifications	1	09-10-2025		**TLM2**	
7.	Introduction to Hydrology	1	11-10-2025		**TLM2**	
8.	Rainwater Harvesting-Water Storage and Conveyance Structures	1	13-10-2025		**TLM2**	
9.	Simple introduction to Dams and Reservoirs	1	15-10-2025		**TLM2**	
No. of classes required to complete UNIT-III: 09				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Assignment-I (Units-I, II & UNIT-III)	A1=5
I-Descriptive Examination (Units-I, II & UNIT-III)	M1=15
I-Quiz Examination (Units-I, II & UNIT-III)	Q1=10
Assignment-II (Unit- IV, V & VI)	A2=5
II- Descriptive Examination (Unit- IV, V & VI)	M2=15
II-Quiz Examination (Unit- 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 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	Possesses necessary skill set to analyse and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyse the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Title	**Course Instructor**	**Course Coordinator**	**Head of the Department**
Name of the Faculty	**M. Manoj Kumar**	**B. Ramakrishna**	**Dr. K.V.Ramana**
Signature			

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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

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

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

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF ARTIFICIAL INTELLIGENCE & DATA SCIENCE

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. G Rambabu

Course Name & Code : IT WORKSHOP Lab & 23IT51

L-T-P Structure : 0-0-2 **Credits: 1**

Program/Sem/Sec : B.Tech. – Mech/I/A **A.Y.:** 2025-26

PREREQUISITE : **NIL**

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of the course is to impart knowledge about the components of PC, Assembling PC, Installation of OS, software's like MS-Office, LaTex and concepts related to Networking, Internet as well as antivirus.

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

CO1	Identify the components of a PC and Assemble & disassemble the same. (Understand)
CO2	Experiment with installation of Operating System and Secure a computer from Cyber threats.(Apply)
CO3	Develop presentation /documentation using Office tools and LaTeX (Apply)
CO4	Build dialogs and documents using ChatGPT. (Apply)
CO5	Improve individual / teamwork skills, communication and 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	-	-
CO2	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO3	3	-	-	-	2	-	-	-	-	-	-	-	2	-	-
CO4	3	-	-	-	-	-	-	-	-	-	-	-	2	-	-
CO5	-	-	-	-	-	-	-	2	2	2	-	-	-	-	-

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

1 - Low **2 –**Medium **3 –** High

REFERENCE BOOKS:

R1	Comdex Information Technology course tool kit, Vikas Gupta, WILEY Dream tech, 2003
R2	The Complete Computer upgrade and repair book, Cheryl A Schmidt, WILEY Dream tech,2013, 3rd edition.
R3	Introduction to Information Technology, ITL Education Solutions limited, PearsonEducation,2012, 2nd edition.
R4	PC Hardware - A Handbook, Kate J. Chase, PHI (Microsoft).
R5	LaTeX Companion, Leslie Lamport, PHI/Pearson.
R6	IT Essentials PC Hardware and Software Companion Guide, David An fins on and KenQuamme. –CISCO Press, Pearson Education, 3rd edition.
R7	IT Essentials PC Hardware and Software Labs and Study Guide, Patrick Regan– CISCO Press, Pearson Education, 3rd edition.

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	HOD Sign Weekly
PC Hardware & Software Installation						
1.	Task-1	3	18-08-2025		**DM5**	
2.	Task-2	3	25-08-2025		**DM5**	
3.	Task-3	3	01-09-2025		**DM5**	
4.	Task-4	3	08-09-2025		**DM5**	
5.	Task-5	3	15-09-2025		**DM5**	
Internet & World Wide Web						
6.	Task-1	3	22-09-2025		**DM5**	
7.	Task-2	3	29-09-2025		**DM5**	
8.	Task-3	3	06-10-2025		**DM5**	
9.	Task-4	3	13-10-2025		**DM5**	
Latex and WORD						
10.	Task-1	3	27-10-2025		**DM5**	
11.	Task-2	3	03-11-2025		**DM5**	
12.	Task-3	3	10-11-2025		**DM5**	
13.	Task-4	3	17-11-2025		**DM5**	
EXCEL						
14.	Task-1	3	24-11-2025		**DM5**	
15.	Task-2	3	01-12-2025		**DM5**	
LOOKUP/VLOOKUP						
16.	Task-1	3	01-12-2025		**DM5**	

POWER POINT						
17.	Task-1	3	08-11-2025		**DM5**	
18.	Task-2	3	08-11-2025		**DM5**	
19.	Task-3	3	15-11-2025		**DM5**	
AI TOOLS – ChatGPT						
20.	Task-1	3	15-12-2025		**DM5**	
21.	Task-2	3	22-12-2025		**DM5**	
22.	Task-3	3	22-12-2025		**DM5**	
23.	Internal exam	3	29-12-2025		**DM5**	

Teaching Learning Methods			
DM1	Chalk and Talk	**DM4**	Assignment/Test/Quiz
DM2	ICT Tools	**DM5**	Laboratory/Field Visit
DM3	Tutorial	**DM6**	Web-based Learning

PART-C

EVALUATION PROCESS (R23 Regulations): According to Academic Regulations of R23 Distribution and Weightage of Marks for Laboratory Courses is as follows

Continuous Internal Evaluation (CIE): The Continuous Internal Evaluation (CIE) is based on the following parameters:

Parameter	**Marks**
Day to Day work	15
Record	15
Internal Test	
Total	**30**

Semester End Examinations (SEE): The Semester End examinations (SEE) for laboratory courses shall be jointly conducted by internal and external examiners with 3 hours' duration and evaluated for 35 marks. The performance of the student shall be evaluated as per the parameters indicated below:

Parameter	**Marks**
Procedure/Algorithm	20
Experimentation/Program execution	30
Result/Inference	
Viva voce	20
Total	**70**

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**Mr. G Rambabu**			
Signature				

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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr.R. Padma Venkat
Course Name & Code : CE LAB, 23FE51
L-T-P Structure : **0-0-3** **Credits:** 01
Program/Sem/Sec : B. Tech I Sem. ME
A.Y. : 2025-26

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): The main objective of introducing this course, Communicative English Laboratory, is to expose the students to a variety of self-instructional, learner friendly modes of language learning. The students will get trained in basic communication skills and also make them ready to face job interviews.

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

CO1	Understand the different aspect of the English language proficiency with emphasis on LSRW skills.	L2
CO2	Apply Communication Skills through various language learning activities	L3
CO3	Identifying the English speech sounds, stress, rhythm, intonation and syllable division for better listening and speaking, comprehension.	L2
CO4	Exhibit professionalism in participating in debates and group discussions.	L3

COURSE ARTICULATION MATRIX (Correlation between COs & POs)

Course Outcomes / PO's →	Programme Outcomes											
	1	**2**	**3**	**4**	**5**	**6**	**7**	**8**	**9**	**10**	**11**	**12**
CO1.	-	-	-	2	-	-	-	-	3	3	-	2
CO2.	-	-	-	2	-	-	-	-	3	3	-	2
CO3.	-	-	-	2	-	-	-	-	3	3	-	2
CO4.	-	-	-	2	-	-	-	-	3	3	-	2
1 = Slight (Low)				**2= Moderate (Medium)**						**3 = Substantial (High)**		

List of Activities:

1. Vowels & Consonants

2. Neutralization / Accent rules

3. Communication Skills: JAM

4. Conversational Practice: Roleplay

5. E-mail Writing

6. Resume writing, Cover letter, SOP

7. Group Discussions - methods & Practice

8. Debates – Methods and practice

9. PPT Presentations & Poster Presentations

10. Interview Skills: Mock Interviews

Suggested Software:

1.Walden Infotech
2.Young India Films

Reference Books:

Raman Meenakshi, Sangeeta-Sharma, *Technical Communication,* Oxford Press 2018.
Taylor Grant: *English Conversation Practice,* Tata McGraw-Hill Education India, 2016.
Hewing's, Martin, Cambridge Academic English (B2), CUP, 2012.
J. Sethi & P.V. Dhamija: *A Course in Phonetics and Spoken English, (*2nd Ed.,*)Kindle, 2013.*

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to syllabus	03	20-8-25		TLM4	
2.	Vowels & Consonants	3+3	3-9-25 10-9-25		TLM1 TLM5	
3.	Neutralization	03	17-9-25		TLM1, TLM5	
4.	Accent rules	03	24-9-25		TLM1, TLM5	
5.	JAM-I (Short and	3+3	8-10-25		TLM4	

	Structured Talks) Self Introduction & Introducing others		15-10-25			
6.	Role Play-I (Formal and Informal)	3+3	29-1025		TLM4	
7.	e-mail Writing,	03	5-11-25		TLM1, TLM5	
8.	Resume writing, Cover letter, SOP	03	12-11-25		TLM1, TLM5	
9.	Group Discussion: methods & Practice	03	19-11-25		TLM4, TLM6	
10.	Debate: methods & Practice	03	26-11-25		TLM4, TLM6	
11.	PPT Presentation	3+3	3-12-25		TLM2, TLM4	
12.	Poster Presentation	03	10-12-25		TLM2, TLM4	
13.	Mock Interviews	03	17-12-25		TLM1, TLM6	
14.	Lab Internal Exam	03	24-12-25			
No. of classes required to complete Syllabus: 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

Laboratory Examination:

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 OUTCOMES (POs):

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

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

	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	**Dr. R. Padma Venkat**	**Dr. R. Padma Venkat**	**Dr. R. Padma Venkat**	**Dr. T.Satyanarayana**
Signature				

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT

Part-A

PROGRAM	**:**	**B.Tech.,I-Sem., ME**
ACADEMICYEAR	**:**	**2025-26**
COURSENAME &CODE	**:**	**ENGINEERING PHYSICS LAB**
L-T-PSTRUCTURE	**:**	**0 – 0 – 3**
COURSECREDITS	**:**	**1**
COURSEINSTRUCTOR	**:**	**P. Vijaya Sirisha / Dr. N. Aruna**
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 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. 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

COURSEDELIVERYPLAN (LESSONPLAN): ECE-D

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign
1.	Introduction & Demonstration	3	22-08-2025		**TLM-4**	CO1, CO2,CO3, CO4 & CO5	T1	
2.	Experiment1	3	29-08-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
3.	Experiment2	3	12-09-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
4.	Experiment3	3	19-09-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
5.	Experiment 3	3	26-09-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
6.	Experiment 4	3	10-10-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
7.	Experiment5	3	17-10-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
8.	**MID-1 Exam**	3	24-10-2025		**---**	---	---	
9.	Experiment 6	3	31-10-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
10.	Experiment 7	3	07-11-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
11.	Experiment8	3	14-11-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
12.	Experiment 8	3	21-11-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
13.	Experiment 9	3	28-11-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	

14	Experiment10	3	05-12-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
15	Revision	3	12-12-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
16	**Internal Exam**	3	19-12-2025		**TLM-4**	CO1, CO2,CO3,CO4 & CO5	T1	
17	**Internal Exam**	3	26-12-2025		**TLM-4**	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.

CourseInstructor	**Course-coordinator**	**Module Coordinator**	**HOD**
P Vijaya Sirisha / Dr. N. Aruna	Dr.S.Yusuf	Dr.S.Yusuf	Dr.T. Satyanarayana

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(An Autonomous Institution since 2010)

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

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

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE HANDOUT

PROGRAM : B.Tech. I-Sem, MECH

ACADEMIC YEAR : 2023-24

COURSE NAME & CODE : Engineering Workshop, 20ME51

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

COURSE CREDITS : 1.5

COURSE INSTRUCTOR : Mr. S. Srinivasa Reddy, Sr. Assistant Professor,
Seelam Srinivasa Reddy, Assoc. Professor

COURSE COORDINATOR : Seelam Srinivasa Reddy, Assoc. Professor

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

COURSE OBJECTIVE:

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

COURSE OUTCOMES (CO)

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

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

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

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

REFERENCE:

R1	Lab Manual

COURSE DELIVERY PLAN (LESSON PLAN): (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	23-08-2025		TLM8	-	
2.	Demonstration	3	30-08-2025		TLM8	R1	
3.	Experiment-1	3	06-09-2025		TLM8	R1	
4.	Experiment-2	3	20-09-2025		TLM8	R1	
5.	Experiment-3	3	27-09-2025		TLM8	R1	
6.	Experiment-4	3	18-10-2025		TLM8	R1	
I-Mid Examinations (20-10-2025 to 25-10-2025)							
7.	Experiment-5	3	01-11-2025		TLM8	61	
8.	Experiment-6	3	15-11-2025		TLM8	R1	
9.	Experiment-7	3	22-11-2025		TLM8	R1	
10.	Experiment-8	3	29-11-2025		TLM8	R1	
11.	Experiment-9	3	06-12-2025		TLM8	R1	
12.	Repetition lab	3	20-12-2025		TLM8	--	
13.	Lab Internal	3	27-12-2025		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.	Induction Program	3	23-08-2025		TLM8	-	
2.	Demonstration	3	30-08-2025		TLM8	R1	
3.	Experiment-1	3	06-09-2025		TLM8	R1	
4.	Experiment-2	3	20-09-2025		TLM8	R1	
5.	Experiment-3	3	27-09-2025		TLM8	R1	
	Experiment-4	3	18-10-2025		TLM8	R1	
I-Mid Examinations (01-04-2024 to 06-04-2024)							
6.	Experiment-4	3	01-11-2025		TLM8	R1	
7.	Experiment-5	3	15-11-2025		TLM8	61	
8.	Experiment-6	3	22-11-2025		TLM8	R1	
9.	Experiment-7	3	29-11-2025		TLM8	R1	
10.	Experiment-8	3	06-12-2025		TLM8	R1	
11.	Experiment-9	3	20-12-2025		TLM8	R1	
12.	Repetition lab	3	27-12-2025		TLM8	--	
13.	Lab Internal	3	23-08-2025		TLM6	--	

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

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	18-08-2025	18-10-2025	8W
I Mid Examinations	20-10-2025	25-10-2025	1W
II Phase of Instructions	27-10-2025	27-12-2025	8W
II Mid Examinations	29-12-2025	03-01-2026	1W
Preparation and Practical's	05-01-2026	10-01-2026	1W
Semester End Examinations	19-01-2026	31-01-2026	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: A-SEC

Batch No.	Reg. No. of Students	Number of Students	Batch No.	Reg. No. of Students	Number of Students
A11	25761A00301-0308	8	A21	25761A00334-0341	8
A12	25761A00309-0316	8	A22	25761A00342-0349	8
A13	25761A00317-0325	9	A23	25761A00350-0357	8
A14	25761A00326-0333	8	A24	25761A00358-0366	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**
Mr. S. Srinivasa Reddy Mr. Seelam. Srinivasa Reddy,	**Mr. Seelam. Srinivasa Reddy**	**Mr. J. Subba Reddy**	**Dr. M. B. S Sreekara Reddy**