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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM   : II B. Tech., I-Sem., CIVIL
ACADEMIC YEAR   : 2025-26
COURSE NAME & CODE   : Numerical Techniques and Statistical Methods
L-T-P STRUCTURE   : 3-0-0
COURSE CREDITS   : 3
COURSE INSTRUCTOR   : K. N. V. Lakshmi
COURSE COORDINATOR   : **K. N. V. Lakshmi**
PRE-REQUISITES   : None

COURSE EDUCATIONAL OBJECTIVES (CEOs):

- To elucidate the different numerical methods to solve nonlinear algebraic equations.

- To disseminate the use of different numerical techniques for carrying out numerical integration.

- To familiarize the students with the foundations of probability and statistical methods.

- To equip the students to solve application problems in their disciplines.

COURSE OUTCOMES (COs)

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

CO1: Evaluate the approximate roots of polynomial and transcendental equations by different algorithms. Apply Newton's forward & backward interpolation and Lagrange's formulae for equal and unequal intervals (L3)

CO2: Apply numerical integral techniques to different Engineering problems. Apply different algorithms for approximating the solutions of ordinary differential equations with initial conditions to its analytical computations (L3)

CO3: Apply discrete and continuous probability distributions (L3)

CO4: Design the components of a classical hypothesis test (L4)

CO5: Infer the statistical inferential methods based on small and large sampling tests (L4)

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

COs/POs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12
CO1	3	2	-	2	-	-	-	-	-	-	-	1
CO2	3	2	-	2	-	-	-	-	-	-	-	1
CO3	3	2	2	3	-	-	-	-	-	-	-	2
CO4	3	2	2	2	-	-	-	-	-	-	-	2
CO5	3	3	3	3	-	-	-	-	-	-	-	2

Note: Enter Correlation Levels **1** or **2** or **3.** If there is no correlation, **put '-'**
     1- Slight (Low), **2 –** Moderate (Medium), **3 -** Substantial (High).
Textbooks:
   T1. B. S. Grewal, Higher Engineering Mathematics, 44th Edition, Khanna Publishers.
   T2. Miller and Freund's, Probability and Statistics for Engineers,7/e, Pearson, 2008.

Reference Books:

R1. Steven C. Chapra, Applied Numerical Methods with MATLAB for Engineering and Science,Tata Mc. Graw Hill Education.

R2. M. K. Jain, S.R.K. Iyengar and R.K. Jain, Numerical Methods for Scientific and Engineering Computation, New Age International Publications.

R3. Lawrence Turyn, Advanced Engineering Mathematics, CRC Press.

R4. S. C. Gupta and V.K. Kapoor, Fundamentals of Mathematical Statistics, 11/e, Sultan Chand & Sons Publications, 2012.

R5. Shron L. Myers, Keying Ye, Ronald E Walpole, Probability and Statistics Engineers and the Scientists,8th Edition, Pearson 2007.

R6. Jay I. **Devore,** Probability and Statistics for Engineering and the Sciences, 9th Edition, Cengage.

Part-B
COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	30-06-2025		TLM1			
2.	Course Outcomes, Program Outcomes	1	01-07-2025		TLM1			

UNIT-I: Iterative Methods

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
3.	Introduction to UNIT I	1	02-07-2025		TLM1	CO1	T1,T2	
4.	Bisection method	1	04-07-2025		TLM1	CO1	T1,T2	
5.	Method of false position	1	07-07-2025		TLM1	CO1	T1,T2	
6.	Secant method	1	08-07-2025		TLM1	CO1	T1,T2	
7.	Iteration method	1	09-07-2025		TLM1	CO1	T1,T2	
8.	Newton-Raphson method	1	11-07-2025		TLM1	CO1	T1,T2	
9.	Newton-Raphson method (simultaneous equations)	1	14-07-2025		TLM1	CO1	T1,T2	
10.	TUTORIAL - I	1	15-07-2025		TLM3	CO1	T1,T2	
11.	Newton's forward formula for interpolation	1	16-07-2025		TLM1	CO1	T1,T2	
12.	Newton's forward formula for interpolation	1	18-07-2025		TLM1	CO1	T1,T2	
13.	Newton's backward formula for interpolation	1	21-07-2025		TLM1	CO1	T1,T2	
14.	Lagrange's interpolation formula	1	22-07-2025		TLM1	CO1	T1,T2	
15.	Lagrange's interpolation formula	1	23-07-2025		TLM1	CO1	T1,T2	
16.	TUTORIAL - II	1	25-07-2025		TLM3	CO1	T1,T2	
17.	Problems	1	28-07-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I		13				No. of classes taken:		

UNIT-II: Numerical integration, Solution of ordinary differential equations with initial conditions

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 Unit – II	1	29-07-2025		TLM1	CO2	T1,T2	
2.	Trapezoidal Rule	1	30-07-2025		TLM1	CO2	T1,T2	
3.	Simpson's 1/3 Rule	1	01-08-2025		TLM1	CO2	T1,T2	
4.	Simpson's 3/8 Rule	1	04-08-2025		TLM1	CO2	T1,T2	
5.	TUTORIAL - III	1	05-08-2025		TLM3	CO2	T1,T2	
6.	Taylor Series Method	1	06-08-2025		TLM1	CO2	T1,T2	
7.	Picard's Method	1	08-08-2025		TLM1	CO2	T1,T2	
8.	Euler's Method	1	11-08-2025		TLM1	CO2	T1,T2	
9.	Runge Kutta Second order method	1	12-08-2025		TLM1	CO2	T1,T2	
10.	Runge Kutta Fourth order method	1	13-08-2025		TLM1	CO2	T1,T2	
11.	Milne's Predictor and Corrector method	1	18-08-2025		TLM1	CO2	T1,T2	
12.	Milne's Predictor and Corrector method	1	19-08-2025		TLM1	CO2	T1,T2	
13.	TUTORIAL - IV	1	20-08-2025		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		11				No. of classes taken:		

I MID EXAMINATIONS (25-08-2025 to 30-08-2025)

UNIT-III: Probability and distributions

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	1	01-09-2025		TLM1	CO3	T1,T2	
2.	Baye's theorem, problems	1	02-09-2025		TLM1	CO3	T1,T2	
3.	Random variables, Expectations	1	03-09-2025		TLM1	CO3	T1,T2	
4.	Problems on PMF	1	05-09-2025		TLM1	CO3	T1,T2	
5.	Problems on PDF	1	08-09-2025		TLM1	CO3	T1,T2	
6.	Binomial distribution	1	09-09-2025		TLM1	CO3	T1,T2	
7.	Poisson distribution	1	10-09-2025		TLM1	CO3	T1,T2	
8.	Uniform distribution	1	12-09-2025		TLM1	CO3	T1,T2	
9.	Normal distribution	1	15-09-2025		TLM1	CO3	T1,T2	
10.	TUTORIAL – V	1	16-09-2025		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		10				No. of classes taken:		

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UNIT-IV: Sampling Theory

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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	1	17-09-2025		TLM1	CO4	T1,T2	
2.	Sampling distribution, definitions	1	19-09-2025		TLM1	CO4	T1,T2	
3.	Sampling distribution of mean, variance	1	22-09-2025		TLM1	CO4	T1,T2	
4.	Problems	1	23-09-2025		TLM1	CO4	T1,T2	
5.	Problems on central limit theorem	1	24-09-2025		TLM1	CO4	T1,T2	
6.	Estimation	1	26-09-2025		TLM1	CO4	T1,T2	
7.	Point and interval estimation	1	06-10-2025		TLM1	CO4	T1,T2	
8.	Estimation using t distribution	1	07-10-2025		TLM1	CO4	T1,T2	
9.	Estimation using χ^2 and F-distributions	1	08-10-2025		TLM1	CO4	T1,T2	
10.	Tutorial-VI	1	10-10-2025		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV	10				No. of classes taken:			

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UNIT-V: Vector Integration

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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.	Testing of Hypothesis definitions	1	13-10-2025		TLM1	CO5	T1,T2	
2.	Z-test for means	1	14-10-2025		TLM1	CO5	T1,T2	
3.	Z-test for means	1	15-10-2025		TLM1	CO5	T1,T2	
4.	Z-test for proportions	1	17-10-2025		TLM1	CO5	T1,T2	
5.	Z-test for proportions	1	20-10-2025		TLM1	CO5	T1,T2	
6.	t-test for means	1	22-10-2025		TLM1	CO5	T1,T2	
7.	F-test for variances	1	24-10-2025		TLM1	CO5	T1,T2	
8.	χ^2-test for goodness of fit	1	27-10-2025		TLM1	CO5	T1,T2	
9.	χ^2-test for independence of attributes	1	28-10-2025		TLM1	CO5	T1,T2	
10.	Tutorial-VII	1	29-10-2025		TLM3	CO5	T1,T2	
11.	Problems	1	31-10-2025		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V	10				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
1.	Gauss interpolation formula	1	22-08-2025		TLM2	CO1	T1,T2	
No. of classes required	1				No. of classes taken:			

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

PART-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: EESHWAR RAM J

Course Name : UHV- II: Understanding Harmony and Ethical Human Conduct

Course Code : 23HS01   **Credits:** 3   **L-T-P Structure:** 3-0-0

Program/Sem/Sec : B.Tech/III Semester – Civil   **A.Y.** : 2025-26

PREREQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): To become more aware of themselves and their surroundings (family, society, nature); they would become more responsible in life and in handling problems with sustainable solutions while keeping human relationships and human nature in mind.

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

CO1: Describe the terms like Natural Acceptance, Happiness and Prosperity (L2)

CO2: Identify one's self, and one's surroundings (family, society nature) (L2)

CO3: Relate human values with human relationship and human society. (L2)

CO4: Illustrate the need for universal human values and harmonious existence (L2)

CO5: Develop as socially and ecologically responsible engineers (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	1		1			2	2	2	2			2			
CO2	1		1			2	2	2	2			2			
CO3	1		1			3	3	3	3			3			
CO4	1		1			3	3	3	3			3			
CO5	1		1			3	3	3	3			3			

TEXTBOOKS:

T1 R R Gaur, r singal, G P Bagaria, "Human values and Professional Ethics", Excel Books, New Delhi,2010

REFERENCE BOOKS:

R1 Jeevan vidya: Ek Parichaya, A.Nagaraj, Jeevan Vidya Prakashan, Amarkantak,1999

R2 Human values, A N Tripathi, New Age Publishers, New Delhi, 2004

R3 The story of my experiments with Truth, Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Value Education

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, COs	1	30-06-2025		TLM2	
2.	Process for self exploration: Natural Acceptance	1	02-07-2025		TLM.2	
3.	Right Understanding, Relationship and Physical Facility	2	03-07-2025 05-07-2025		TLM2	
4.	Understanding Value Education	1	07-07-2025		TLM2	
5.	self-exploration as the Process for Value Education	1	09-07-2025		TLM2	
6.	Continuous Happiness and Prosperity	2	10-07-2025 12-07-2025		TLM2	
7.	Happiness and Prosperity	1	14-07-2025		TLM2	
8.	Method to Fulfill the Basic Human Aspirations	1	16-07-2025		TLM2	
9.	Tutorial	1	17-07-2025		TLM2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Harmony in the Human Being

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Understanding Human being as the Co-existence of the self and the body	1	19-07-2025		TLM2	
11.	Distinguishing between the Needs of the self and the body	2	21-07-2025 23-07-2025		TLM2	
12.	The body as an Instrument of the self	1	24-07-2025		TLM2	
13.	Understanding Harmony in the self	2	26-07-2025 28-07-2025		TLM2	
14.	Harmony of the self with the body	1	30-07-2025		TLM2	
15.	Programme to ensure self-regulation and Health	1	31-07-2025		TLM2	
16.	Tutorial - 1	1	02-08-2025		TLM2	
17.	Tutorial -2	1	04-08-2025		TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT III: Harmony in the Family and Society

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Harmony in the Family	2	11-08-2025 13-08-2025		TLM2	
19.	'Trust' – the Foundational Value in Relationship	1	14-08-2025		TLM2	
20.	Practice Session PS7 Exploring the Feeling of Trust	1	18-08-2025		TLM2	
21.	'Respect' – as the Right Evaluation	1	20-08-2025		TLM1	
22.	Practice Session PS8 Exploring the Feeling of Respect	2	21-08-2025 23-08-2025		TLM2	
23.	Other Feelings, Justice in Human-to-Human Relationship	1	01-09-2025		TLM2	
24.	Understanding Harmony in the Society	2	03-09-2025 04-09-2025		TLM2	
25.	Vision for the Universal Human Order	1	06-09-2025		TLM2	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: Harmony in the Nature/Existence

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	Understanding Harmony in the Nature	2	08-09-2025 10-09-2025		TLM2	
27.	Interconnectedness, self-regulation	1	11-09-2025		TLM2	
28.	Mutual Fulfilment among the Four Orders of Nature	1	13-09-2025		TLM2	
29.	Realizing Existence as Co-existence at All Levels	2	15-09-2025 17-09-2025		TLM2	
30.	The Holistic Perception of Harmony in Existence	2	18-09-2025 20-09-2025		TLM2	
31.	Tutorial -1	2	22-09-2025 24-09-2025		TLM2	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: Implications of the Holistic Understanding

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Natural acceptance of human values	1	25-09-2025		TLM2	
33.	Definitiveness of ethical human conduct	1	27-09-2025		TLM2	
34.	Basis for humanistic education	1	29-09-2025		TLM2	

35.	A Basis for Humanistic Education, Humanistic	2	01-10-2025 04-10-2025		TLM2	
	Constitution and Universal Human	1	06-10-2025		TLM2	
36.	Competence in professional ethics	1	08-10-2025		TLM2	
37.	Strategy for transition from the present state to universal human order	2	09-10-2025 11-10-2025		TLM2	
38.	Holistic Technologies, Production Systems and Management Models-Typical Case	2	13-10-2025 25-10-2025		TLM2	
No. of classes required to complete UNIT-V:10				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

ACADEMIC CALENDAR: A.Y 2024-25

Description	From	To	Weeks
I Phase of Instructions	15-07-2024	31-08-2024	7W
I Mid Examinations	**02-09-2024**	**07-09-2024**	**1 W**
II Phase of Instructions	09-09-2024	09-11-2024	9W
II Mid Examinations	**11-11-2024**	**16-11-2024**	**1 W**
Preparation and Practical	18-11-2024	23-11-2024	1 W
Semester End Examinations	**25-11-2024**	**07-12-2024**	**2 W**

Signature				
Name of the Faculty	**Eeshwar Ram J**		**Eeshwar Ram J**	**Dr. K V Raman.**
Title	**Course Instructor**		**Module Coordinator**	**Head of the Department**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.Manoj Kumar .M
Course Name & Code : SURVEYING & 23CE01   **Regulation**: R23
L-T-P Structure :03-0-0   **Credits:** 03
Program/Sem/Sec : B.Tech/III Sem/A   **A.Y.:** 2025-26

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The objective of this course are to:
1. Know the principle and methods of surveying and measuring of horizontal and vertical- distances and angles
2. Identification of source of errors and rectification methods
3. Know surveying principles to determine areas and volumes
4. Setting out curves and use modern surveying equipment's for accurate results
5. Know the basics of Photogrammetry Surveying

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

CO	Statements	Blooms level
CO 1	Summaries the principle and methods of surveying and measuring of horizontal and vertical- distances and angles	Understand
CO 2	Identify the source of errors and rectification methods	Understand
CO 3	Apply surveying principles to determine areas and volumes	Apply
CO 4	Setting out curves and using modern surveying equipment's	Apply
CO 5	Understand the basics of Photogrammetry Surveying in field	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	2	1	1								-	--	2		
CO2	2	1	2								-	--		2	
CO3	3	2									-	--		2	
CO4	2	1	1								-	--			
CO5	3	1	2								-	--	2	2	
	1 - Low				**2 –**Medium				**3 -** High						

TEXT BOOKS:

1. Surveying (Vol – 1 & 2) by Duggal S K, Tata McGraw Hill Publishing Co. Ltd. New Delhi, 5th edition, 2019.
2. Textbook of Surveying by C Venkatramaiah, Universities Press 1st Edition, 2011.

REFERENCE BOOKS:

1. Surveying (Vol – 1), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi, 18th edition 2024.

2. Surveying (Vol – 2), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi 17th 2022.

3. Surveying (Vol – 3), by B. C. Punmia, Ashok Kumar Jain and Arun Kumar Jain - Laxmi Publications (P) ltd., New Delhi 16th 2023.

4. Plane Surveying and Higher Surveying‖ by Chandra A M, New age International Pvt. Ltd.,Publishers, New Delhi, 3rd Edition, 2015.

5. Surveying and Levelling by N.Basak Tata McGraw Hill Publishing Co. Ltd. New Delhi, 4th edition, 2014.

6. Surveying (Vol 1, 2 & 3), by Arora K R, Standard Book House, Delhi. Edition: 12th, 2015.

Web Resources:

https://koha.srmap.edu.in/cgi-bin/koha/opac-detail.pl?biblionumber=11522&shelfbrowse_itemnumber=23066

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: INTRODUCTION AND BASIC CONCEPTS, LINEAR DISTANCES AND PRISMATIC COMPASS

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 Course and COs	1	01-07-2025		TLM2	
2.	Introduction to Unit-I	1	02-07-2025		TLM2	
3.	Objectives, Classification and principles of surveying	1	03-07-2025		TLM2	
4.	Surveying accessories	1	04-07-2025		TLM2	
5.	Compass- Survey-Introduction	1	08-07-2025		TLM2	
6.	leveling	1	09-07-2025		TLM2	
7.	Plane table surveying	1	10-07-2025		TLM2	
8.	Linear distances- Approximate methods, Direct Methods- Chains-Tapes, ranging, Tape corrections	1	11-07-2025		TLM1	
9.	Prismatic Compass- Bearings, included angles, W.C.B and Q.B systems of locating bearings.	1	15-07-2025		TLM1	
10.	Local Attraction, Magnetic Declination, and dip –systems	1	16-07-2025		TLM1	
No. of classes required to complete UNIT-I:10				**No. of classes taken:10**		

UNIT-II: LEVELLING, CONTOURING, AREAS AND VOLUMES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of levels, methods of leveling,	1	17-07-2025		TLM2	
2.	Determination of levels.	1	18-07-2025		TLM1	
3	TUTORIAL-1		22-07-2025		TLM3	
4.	Effect of Curvature of Earth and Refraction	1	23-07-2025		TLM2	
5.	Contouring- Characteristics	1	24-07-2025		TLM2	
6.	uses of Contours, methods of contour surveying.	1	25-07-2025		TLM2	
7.	Areas - Determination of areas consisting of irregular boundary and regular boundaries	1	29-07-2025		TLM1	
8.	TUTORIAL-2	1	30-07-2025		TLM3	
9.	Volumes -Determination of volume of earth work in cutting and	1	31-07-2025		TLM1	
10.	TUTORIAL-3	1	1-08-2025		TLM3	
11.	embankments for level section, capacity of reservoirs.	1	05-08-2025		TLM2	
No. of classes required to complete UNIT-II:10				**No. of classes taken:10**		

UNIT-III: THEODOLITE SURVEYING AND TRAVERSING

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.	Theodolite Surveying: Types of Theodolites, temporary adjustments,	1	06-08-2025		TLM2	
2.	measurement of horizontal angle by repetition method and reiteration method,	1	07-08-2025		TLM1	
3.	measurement of vertical Angle,	1	08-08-2025		TLM1	
4.	Trigonometrical leveling when base is accessible and inaccessible.	1	12-08-2025		TLM1	
5.	TUTORIAL-1	1	13-08-2025		TLM3	
6.	Traversing: Methods of traversing,	1	14-08-2025		TLM1	
7	traverse computations and adjustments,		19-08-2025		TLM3	
8.	TUTORIAL-2	1	20-08-2025		TLM1	
9.	Introduction to Omitted measurements.	1	**21-08-2025**		TLM3	
10.	Problems	1	22-08-2025		TLM3	
11.	Problems	1	02-09-2025		TLM3	
12.	TUTORIAL-3	1	03-09-2025		TLM3	
No. of classes required to complete UNIT-III:11				**No. of classes taken:**		

UNIT-IV: CURVES AND MODERN SURVEYING METHODS

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.	Curves: Types of curves and their necessity	1	04-09-2025		TLM1	
2.	elements of simple, compound, reverse curves	3	09-09-2025		TLM1	
	Problems		10-09-2025		TLM3	
3.	Introduction to Tacheometric Surveying.	1	11-09-2025		TLM2	
4.	Problems	1	12-09-2025		TLM3	
5.	Tutorial-I	1	16-09-2025		TLM3	
6.	Introduction-Modern Surveying Methods:	1	17-09-2025		TLM2	
7.	Total station- advantages and Applications.	1	18-09-2025		TLM2	
8.	Introduction to Global Positioning System.	1	19-09-2025		TLM2	
9.	Introduction to Drone survey	1	23-09-2025		TLM2	
10.	LiDAR Survey (Light Detection and Ranging).	1	24-09-2025		TLM2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Photogrammetry 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.	Introduction, Basic concepts,	1	25-09-2025		TLM2	
2.	perspective geometry of aerial photograph,	1	26-09-2025		TLM2	
3.	relief and tilt displacements,	1	03-10-2025		TLM2	
4.	terrestrial photogrammetry, flight planning;	1	08-10-2025		TLM2	
5.	Stereoscopy, ground control extension for photographic mapping-	1	09-10-2025		TLM2	
6.	aerial triangulation, radial triangulation, methods.	1	14-10-2025		TLM2	
7.	photographic mapping- mapping using paper prints,	1	15-10-2025		TLM2	
8.	mapping using stereo-	1	16-10-2025		TLM2	
9.	plotting instruments, mosaics,	1	17-10-2025		TLM2	
10.	map substitutes	1	21-10-2025		TLM2	
11.	tutorials	1	24-10-2025		TLM3	
No. of classes required to complete UNIT-V: 11				**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 (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	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyze 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	Module Coordinator	Head of the Department
Name of the Faculty	Mr.M. Manoj Kumar	Dr C.Rajamallu	Dr C.Rajamallu	Dr. K. Venkata Ramana
Signature				

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: Dr C.Rajamallu
Course Name & Code : **23CE52 - SURVEYING LAB**   **Regulation**: R23
L-T-P Structure : **0-0-3**   **Credits:** 1.5
Program/Sem/Sec : B.Tech-Civil-III Sem   **A.Y.:** 2024-25

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

By the end of this course student will be able to

1. Know about various linear and angular measuring instruments

2. Take Measurements in the linear and angular view

3. Determine the area and volume by interpreting the data obtained from surveying activities

4. Know modern equipment such as total station

5. Draft field notes from survey data

COURSE OUTCOMES (COs):
Upon the successful completion of this course, the students will able to:
1. Handle various linear and angular measuring instruments
2. Measure the linear and angular measurements
3. Calculate the area and volume by interpreting the data obtained from surveying activities
4. Handle modern equipment such as total station
5. Prepare field notes from survey data

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

TEXTBOOKS:
T1 R. Agor "A Text Book of Surveying and Leveling", Khanna Publishers, New Delhi, 1998.
T2 Punmia B.C., "Surveying Vol I and II", Laxmi Publications 9th, 10th Edition, 1987.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Chain survey of road profile with offsets in case of road widening.	2	15-07-2024 18-07-2024	15-07-2024 18-07-2024	TLM4	
2.	Determination of distance between two inaccessible points by using compass.	2	22-07-2024 25-07-2024	22-07-2024 25-07-2024	TLM4	
3.	Plane table survey ;finding the area of a given boundary by the method of Radiation	2	29-07-2024 01-08-2024	29-07-2024 01-08-2024	TLM4	
4.	Fly levelling : Height of the instrument method (differential leveling)	2	05-08-2024 08-08-2024	05-08-2024 08-08-2024	TLM4	
5.	Fly levelling: rise and fall method.	2	12-08-2024 22-08-2024	12-08-2024 22-08-2024	TLM4	
6.	Theodolite survey: determining the horizontal and vertical angles by the method ofrepetition method	2	29-08-2024 02-09-2024	29-08-2024 02-09-2024	TLM4	
7.	Theodolite survey: finding the distance between two in accessible points.	2	05-09-2024 09-09-2024	05-09-2024 09-09-2024	TLM4	
8.	Theodolite survey: finding the height of far object	2	12-09-2024 19-09-2024	12-09-2024 19-09-2024	TLM4	
9.	Determination of distance between two inaccessible point by using total station	2	23-09-2024 26-09-2024	23-09-2024 26-09-2024	TLM4	
10.	Determination of area perimeter using total station	2	30-09-2024 14-10-2024	30-09-2024 14-10-2024	TLM4	
11.	Setting out a curve	2	17-10-2024 21-10-2024	17-10-2024 21-10-2024	TLM4	
12	Determining the levels of contours	2	28-10-2024 04-11-2024	28-10-2024 04-11-2024	TLM4	
No. of classes required to complete:24				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work = **A**	1,2,3,4,5,6,7,8…	A=05
Record = **B**	1,2,3,4,5,6,7,8	B=05
Internal Test = **C**	1,2,3,4,5,6,7,8	C = 05

Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8	15
Semester End Examinations = D	1,2,3,4,5,6,7,8	D = 35
Total Marks: A + B + C + D = 50	1,2,3,4,5,6,7,8	50

PART-D

PROGRAMME OUTCOMES (POs):

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

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor : Dr. K. V. Ramana
Course Name & Code : Strength of Materials & 23CE02
L-T-P Structure : 3-0-0   Credits: 3
Program/Sem/Sec : B.Tech., CE., III-Sem.,   A.Y : 2025-26
PRE-REQUISITE : Applied Mechanics

COURSE EDUCATIONAL OBJECTIVES (CEOs): The course teaches about mechanical properties of engineering materials such as tensile, compression strength, torsion & bending strength. The behaviour of beam / Column elements with different support conditions and loading system will be discussed.

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

CO 1	To relate the deformations with the stress strain characteristics of materials under axial loading. **(Understand)**
CO 2	To draw the diagrams indicating the variation of the key performance features like axial forces, bending moment and shear forces in structural members. **(Apply)**
CO 3	To calculate section modulus and for determination of stresses developed in the beams. **(Apply)**
CO 4	To compute the deflections due to various loading conditions. **(Apply)**
CO5	To determine stresses across sections of the thin, thick cylinders and columns to arrive at optimum sections to withstand the internal pressure using Lame's equation. **(Apply)**

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

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

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

TEXTBOOKS:

   T1. Strength of Materials by R. K. Bansal, Lakshmi Publications, 16th Edition, 2022.
   T2. Strength of Materials by J.K. Gupta and S.K. Gupta, Cengage publications 2nd edition, 2024.

REFERENCES:

   R1. Strength of Materials by B. S. Basavarajaiah and P. Mahadevappa, Universities Press 3rd Edition, 2010.

R2. Advanced Mechanics of Solids, L.S Srinath, McGraw Hill Education, 2017, 3rdEdition.

R3. Strength of Materials - Fundamentals and Applications, T.D.Gunneswara Rao and MudimbyAndal, Cambridge University Press, 2018, 1st Edition.

R4. Mechanics of Materials, Beer and Johnston, McGraw Hill India Pvt. Ltd., 2020, 8th Edition (SI Units).

R5. Mechanics of Solids — E P Popov, Prentice Hall, 2nd Edition, 2015.

R6. A Textbook of Strength of Materials, by R. K. Rajput, 7e (Mechanics of Solids) SIUnits S. Chand & Co, NewDelhi 7th edition 2022.

R7. Strength of Materials by S.S.Ratan Tata McGrill Publications 3rd Edition , 2016.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: SIMPLE STRESSES AND STRAINS

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.	Interaction	1	30-06-2025		1	
2.	Introduction to Strength of Materials	1	01-07-2025		1	
3.	Mechanical Properties of Materials	1	02-07-2025		1	
4.	Types of stresses and strains	1	03-07-2025		1	
5.	Stress strain diagram and Hooks law	1	07-07-2025		1,2	
6.	Problems on Stress strain Relationship	1	08-07-2025		1	
7.	Analysis of Varying bars	1	09-07-2025		1	
8.	Problems on Compound bars	1	10-07-2025		1	
9.	Relation between Elastic constants	1	14-07-2025		1	
10.	Stresses in Composite bars	1	15-07-2025		1	
11.	Stresses in Composite bars	1	16-07-2025		1,6	
12.	Tutorial	1	17-07-2025		3	
No. of classes required to complete UNIT-I: 12				**No. of classes taken:**		

UNIT-II: SHEAR FORCE AND BENDING MOMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of beams and loads on beams	1	21-07-2025		1,2	
2.	Reactions in SS beam with elementary loads	1	22-07-2025		1	
3.	Reactions in SS beam with elementary loads	1	23-07-2025		1	
4.	Reactions in cantilever beam with elementary loads	1	24-07-2025		1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
5.	SFD and BMD in Cantilever beam with UDL and point load	1	28-07-2025		1	
6.	SFD and BMD in Cantilever beam with Partial UDL and varying loads	1	29-07-2025		1	
7.	SFD and BMD in SS beam with UDL and point load	1	30-07-2025		1	
8.	Turotial	1	31-07-2025		3	
9.	SFD and BMD in SS beam with Partial UDL and varying loads	1	04-08-2025		1	
10.	Turotial	1	05-08-2025		3	
11.	SFD and BMD of Cantilever beam with combined loading	1	06-08-2025		1,2	
12.	Turotial	1	07-08-2025		3	
13.	SFD and BMD of Cantilever beam with combined loading	2	11-08-2025 12-08-2025		1,2	
14.	SFD and BMD of SS beam with combined loading	2	13-08-2025 14-08-2025		1	
15.	SFD and BMD of SS beam with combined loading	1	18-08-2025		1,6	
16.	Relation B/W shear force loading and BMD - Loading	1	19-08-2025		1	
17.	Turotial	1	20-08-2025		3	

No. of classes required to complete UNIT-II: 17			No. of classes taken:			

UNIT-III: Flexural and Shear Stresses - Torsion

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.	Pure bending equation derivation	1	21-08-2025		1,2	
2.	I MID Examinations		25-08-2025			
3.	I MID Examinations		26-08-2025			
4.	I MID Examinations		27-08-2025			
5.	I MID Examinations		28-08-2025			
6.	Finding bending stress in rectangular section	1	01-09-2025		1	
7.	Finding bending stress in I,T section	1	02-09-2025		1	
8.	Design of simple beam for bending	1	03-09-2025		1	
9.	Horizontal shear stress derivation	1	04-09-2025		1,2	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Horizontal shear stress in Rec. sec	1	04-09-2025		1,2	
11.	Horizontal shear stress in Circular and Triangular sec	1	08-09-2025		1,2	
12.	Horizontal shear stress in I section	1	09-09-2025		1,2	
13.	Torsion formula Derivation	1	10-09-2025		1	
14.	Problems on finding shear stress in shafts	1	11-09-2025		1	
15.	Problems on finding power transmitted in shafts	1	15-09-2025		1,6	
No. of classes required to complete UNIT-V: 11				No. of classes taken:		

UNIT-IV: DEFLECTION OF BEAMS

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 deflection of beams	1	16-09-2025		1,2	
2.	Double integration method application to Cantilever beam loadings	1	17-09-2025		1	
3.	Double integration method application to Cantilever beam loadings	1	18-09-2025		1	
4.	Double integration method application to simply supported beam loadings	1	22-09-2025		1	
5.	Macaulay's method application to simply supported beam loadings	1	23-09-2025		1	
6.	Macaulay's method application to simply supported beam loadings	1	24-09-2025		1	
7.	Moment area method application to find deflections in cantilevers	1	25-09-2025		1	
8.	Moment area method application to find deflections in SS beam	1	06-10-2025		1	
9.	Moment area method application to find deflections in SS beam	1	07-10-2025		1,6	
10.	Review on Unit-4	1	08-10-2025		1,6	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT-V: COLUMNS- THIN AND THICK CYLINDERS

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.	Terminology in columns and Euler's long column	1	09-10-2025		1,2	
2.	Critical load for both ends hinged and fixed support conditions of columns	1	13-10-2025		1,2	

3.	Critical load for one end hinged/free and other end fixed	1	14-10-2025		1,2	
4.	Slenderness ratio and Limitation of Euler's theorem	1	15-10-2025		1,2	
5.	Rankine – Gordon formula and application	1	16-10-2025		1,2	
6.	Eccentric loading and Secant formula	1	20-10-2025		1,2	
7.	Longitudinal and circumferential stresses	1	22-10-2025		1	
8.	Hoop, longitudinal and volumetric strains	1	23-10-2025		1	
9.	Changes in volume of cylinder	1	27-10-2025		1,6	
10.	Lames theory for thick	1	28-10-2025		1	
11.	Stresses in thick cylinders	1	29-10-2025		1	
12.	Compound cylinders	1	30-10-2025		1	
13.	II MID Examinations		03-11-2025			
14.	II MID Examinations		04-11-2025			
15.	II MID Examinations		05-11-2025			
16.	II MID Examinations		06-11-2025			
No. of classes required to complete UNIT-IV: 13				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R20Regulations):

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

PART-D

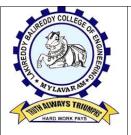### PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze 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	Module Coordinator	Head of the Department
Name of the Faculty	Dr. K. V. Ramana	Dr. K. V. Ramana	Dr.C.Rajamallu	Dr. K. V. Ramana
Signature				

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr.V. Ramakrishna,
Course Name & Code : Fluid Mechanics (23CE13)
Regulation : R23
L-T-P Structure : **3**-0-0　　　　　　　　　　**Credits:** 03
Program/Sem/Sec : B.Tech – III Semester – A Section　　**A.Y.:** 2025-26

Pre-requisites: Engineering Mechanics

Course Objectives:

1. To explain basics of statics, kinematics and dynamics of fluids and various measuring techniques of hydrostatic forces on objects.
2. To impart the ability to solve engineering problems in fluid mechanics.
3. To enable the students measure quantities of fluid flowing in pipes, tanks and channels.
4. To teach integral forms of fundamental laws of fluid mechanics to predict relevant pressures, velocities and forces.
5. To strengthen the students with fundamentals useful in application-intensive courses dealing with hydraulics, hydraulic machinery and hydrology in future courses.

Course Outcomes*:* At the end of the course, the students will be able to:

CO1: Understand the fluid properties, principles of fluid statics, and buoyancy. (Understand)

CO2: Apply the laws of fluid statics and buoyancy. **(Apply)**

CO3: Understand the fundamentals of fluid kinematics, dynamics, differentiate types of fluid flows and loss in pipes. **(Understand)**

CO4: Derive and apply the principle of conservation of mass energy and momentum for flow measurement. **(Apply)**

CO5: Compute the losses in pipes and discharge through pipe flows. **(Apply)**

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

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

TEXTBOOKS:

1. R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th Edition, 2024.
2. P. N. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd Edition, 2019.

REFERENCES:

1. K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd Edition 2018
2. C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.
3. N. Narayana Pillai, Principles of Fluid Mechanics and Fluid Machines, Universities Press Pvt Ltd, Hyderabad. 3rd Edition 2009.
4. Fluid Mechanics by Frank M. White, Henry Xue, Tata McGraw Hill, 9th Edition, 2022.
5. Introduction to Fluid Mechanics & Fluid Machines by S K Som, Gautam Biswas, S Chakraborty Tata McGraw Hill, 3rd Edition 2011

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT–I: Properties of fluids and Fluid statics

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	1	2.7.25		1	
2	Basic properties	1	3.7.25		1	
3	Viscosity	1	4.7.25		1	
4	Problems	1	5.7.25		1	
5	Types of fluids, surface tension	1	9.7.25		1	
6	Capillarity	1	10.7.25		1	
7	Compressibility and Bulk Modulus	1	11.7.25		1	
8	Fluid pressure basics	1	12.7.25		1	
9	Pascal law	1	16.7.25		1	
10	Peizometer and manometer	1	17.7.25		1	
11	Differential manometer	1	18.7.25		1	
12	Pressure gages	1	19.7.25		1	
13	Problems	1	23.7.25		1	
14	Problems	1	24.7.25		1	
No. of classes required to complete UNIT-I: 14				**No. of classes taken:**		

UNIT–II: Hydrostatic Forces and Buoyancy

S No	Topics to be covered	No. of classes required	Tentative date of completion	Actual date of completion	Teaching Learning Methods	HOD sign weekly
15	HSF on vertical and horizontal planes	1	25.7.25		1	

S No	Topics to be covered	No. of classes required	Tentative date of completion	Actual date of completion	Teaching Learning Methods	HOD sign weekly
16	Problems	1	26.7.25		1	
17	Problems	1	30.7.25		1	
18	HSF on inclined planes	1	31.7.25		1	
19	Problems	1	1.8.25		1	
20	Buoyancy and metacentre	1	2.8.25		1	
21	Problems	1	6.8.25		1	
22	Equilibrium of floating bodies	1	7.8.25		1	
23	Problems	1	8.8.25		1	
24	Equilibrium for submerged bodies	1	9.8.25		1	
25	Problems	1	13.8.25		1	
No. of classes required to complete UNIT-II: 11				**No. of classes taken:**		

Mid-1: 25.8.25 to 30.8.25

UNIT–III: Fluid Kinematics

S No	Topics to be covered	No. of classes required	Tentative date of completion	Actual date of completion	Teaching Learning Methods	HOD sign weekly
26	Types of fluid flows	1	14.8.25		1	
27	Types of fluid flows	1	16.8.25		1	
28	Types of fluid flows	1	20.8.25		1	
29	Types of fluid flows	1	21.8.25		1	
30	Velocity potential and Stream function	1	22.8.25		1	
31	Problems	1	23.8.25		1	
32	Continuity equation for 1-D flow	1	3.9.25		1	
33	Problems	1	4.9.25		1	
34	Continuity equation for 3D flow	1	5.9.25		1	
35	Problems	1	6.9.25		1	
No. of classes required to complete UNIT-III: 10				**No. of classes taken:**		

UNIT–IV: Fluid Dynamics

S No	Topics to be covered	No. of classes required	Tentative date of completion	Actual date of completion	Teaching Learning Methods	HOD sign weekly
36	Types forces, Euler's equation	1	10.9.25		1	
37	Bernoulli equation	1	11.9.25		1	
38	Problems	1	12.9.25		1	
39	Venturimeter	1	13.9.25		1	
40	Orificemeter	1	17.9.25		1	
41	Pitot tube	1	18.9.25		1	
42	Problems	1	19.9.25		1	
43	Forces exerted on pipe bend	1	20.9.25		1	
44	Problems	1	24.9.25		1	
45	Problems	1	25.9.25		1	
46	Free vortex flow	1	26.9.25		1	
47	Problems	1	27.9.25		1	

S No	Topics to be covered					
48	Forced vortex flow	1	1.10.25		1	
49	Problems	1	2.10.25		1	
No. of classes required to complete UNIT-IV: 14				**No. of classes taken:**		

UNIT–V: Head losses in Pipe flows

S No	Topics to be covered	No. of classes required	Tentative date of completion	Actual date of completion	Teaching Learning Methods	HOD sign weekly
50	Energy losses in pipelines	1	3.10.25		1	
51	Darcy-Weisbach equation	1	4.10.25		1	
52	Problems	1	8.10.25		1	
53	Pipes in series and parallel	1	9.10.25		1	
54	Problems	1	10.11.25		1	
55	Problems	1	11.11.25		1	
56	Problems	1	15.10.25		1	
57	HGL and TEL	1	16.10.25		1	
58	Problems	1	17.10.25		1	
59	Dimensionless numbers	1	18.10.25		1	
60	Dimensionless numbers	1	22.10.25		1	
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

Mid-2: 3.11.25 to 8.11.25

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
Internal Examination	30
Semester End Examination	70
Total Marks:	**100**

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	To possess knowledge in both fundamental and application aspects of mathematical, scientific, engineering principles to analyze complex engineering problems for meeting the national and international requirements and demonstrating the need for sustainable development.
PEO 2	To adapt to the modern engineering tools for planning, analysis, design, implementation of analytical data and assess their relevant significance in societal and legal issues necessary in their professional career.
PEO 3	To exhibit professionalism, ethical attitude, communication, managerial skills, team work and social responsibility in their profession and adapt to current trends by engaging in continuous learning.

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 analyze and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyze the various laboratory test 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	HOD
Name of faculty	**Dr V. Ramakrishna**	**J. Rangaiah**	**Dr K.V. Ramana**
Signature			

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FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM	: II B. Tech., III-Sem., CE
ACADEMIC YEAR	: 2025-26
COURSE NAME & CODE	: **Environmental Science**
L-T-P STRUCTURE	: 2-0-0
COURSE CREDITS	: 0
COURSE INSTRUCTOR	: Dr. Shaheda Niloufer
COURSE COORDINATOR	: Dr. Shaheda Niloufer
PRE-REQUISITES	: biology, chemistry, geology, mathematics or physics

Course Objectives:

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

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

CO 1	The necessity of resources, their exploitation and sustainable management	L2
CO 2	The interactions of human and ecosystems and their role in the food web in the natural world and the global biodiversity, threats to biodiversity and its conservation.	L2
CO 3	Environmental problems like pollution, disasters and possible solutions.	L1
CO 4	The importance of environmental decision making in organizations through understanding the environmental law and environmental audits.	L2
CO 5	Environmental issues like over population, human health etc related to local, regional and global levels.	L2

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

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

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. Erach Bharucha,Text book of Environmental Studies for Undergraduate Courses,Universities Press (India) Private Limited, 2019.
    T2. Palaniswamy,EnvironmentalStudies,2/e,Pearseducation,2014.
    T3.S.AzeemUnnisa,EnvironmentalStudies,AcademicPublishingCompany,2021.

T4. K.RaghavanNambiar,"TextbookofEnvironmentalStudiesforUndergraduate
Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

ReferenceBooks:

R1. KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.

R2. DeekshaDaveandE.SaiBabaReddy,TextbookofEnvironmentalScience,2/e, Cengage Publications, 2012.

R3. M.AnjiReddy,"TextbookofEnvironmentalSciencesandTechnology",BSPublication, 2014.

R4. J.P.Sharma,ComprehensiveEnvironmentalstudies,Laxmipublications,2006.

R5. J.GlynnHenryandGaryW.Heinke,EnvironmentalSciencesandEngineering, Prentice Hall of India Private limited, 1988.

R6. G.R.Chatwal,ATextBookofEnvironmentalStudies,HimalayaPublishingHouse, 2018.

R7. GilbertM.MastersandWendellP.Ela,IntroductiontoEnvironmentalEngineering and Science, 1/e, Prentice Hall of India Private limited, 1991.

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to the course	1	02-07-2025		TLM2			

UNIT-I: Multidisciplinary Nature of Environmental Studies

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
2.	Natural Resources – Forest resources	1	05-07-2025		TLM1	CO1	T1,T2	
3.	Water resources	1	09-07-2025		TLM1	CO1	T1,T2	
4.	Mineral resources	1	16-07-2025		TLM1	CO1	T1,T2	
5.	Food resources	1	19-07-2025		TLM1	CO1	T1,T2	
6.	Energy resources	1	23-07-2025		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I	05					No. of classes taken:		

UNIT-II: Ecosystems and Biodiversity

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
7.	Ecosystems – Structure & Functions	1	30-07-2025		TLM1	CO2	T1,T2	
8.	Ecological succession &	1	02-08-2025		TLM1	CO2	T1,T2	
9.	Food chains, Food webs & Ecological Pyramids	1	06-08-2025		TLM1	CO2	T1,T2	
10.	Biodiversity – introduction, levels, bio geographic classification	1	13-08-2025		TLM1	CO2	T1,T2	
11.	Values of Biodiversity, India as mega diversity nation	1	20-08-2025		TLM1	CO2	T1,T2	
12.	Threats to biodiversity and Conservation of biodiversity	1	20-08-2025		TLM1	CO2	T1,T2	

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
13.	Biodiversity – introduction, levels, bio geographic classification	1	23-08-2025		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-II		07			No. of classes taken:			

I MID EXAMINATIONS (25-08-2025 TO 30-08-2025)

UNIT-III: Environmental Pollution

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
14.	Environmental pollution -Air pollution	1	03-09-2025		TLM1	CO3	T1,T2	
15.	Water pollution, Marine pollution, Thermal pollution	1	06-09-2025		TLM1	CO3	T1,T2	
16.	Soil pollution	1	10-09-2025		TLM1	CO3	T1,T2	
17.	Noise pollution & Nuclear Hazards	1	17-09-2025		TLM1	CO3	T1,T2	
18.	Solid waste management	1	20-09-2025		TLM1	CO3	T1,T2	
19.	Disaster management	1	24-09-2025		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social Issues and Environment

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
20.	From Unsustainable to Sustainable development	1	27-09-2025		TLM1	CO4	T1,T2	
21.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	01-10-2025		TLM1	CO4	T1,T2	
22.	Environmental ethics, Climate change	1	04-10-2025		TLM1	CO4	T1,T2	
23.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	08-10-2025		TLM1	CO4	T1,T2	
24.	Environmental Acts	1	15-10-2025		TLM1	CO4	T1,T2	
25.	Environmental Acts	1	18-10-2025		TLM1	CO4	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human Population & Environment

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

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
26.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	22-10-2025		TLM1	CO5	T1,T2	
27.	Environment and human health –Human Rights – Value Education	1	25-10-2025		TLM1	CO5	T1,T2	
28.	HIV/AIDS – Women and Child Welfare	1	29-10-2025		TLM1	CO5	T1,T2	
29.	Role of information Technology in Environment and human health	1	01-11-2025		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		04			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
30.	Case studies	2	18-08-2025 27-10-2025		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			

II MID EXAMINATIONS (03-11-2025 TO 08-11-2025)

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

PART-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

	methods including design of experiments, analysis and interpretation of data and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts and demonstrate the knowledge of and need for sustainable development.
PO 8	**Ethic**s: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual and as a member or leader in diverse teams and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as being able to comprehend and write effective reports and design documentation, make effective presentations and give and receive clear instructions.
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PO 12	**Life-long learning**: Recognize the need for and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

Dr. Shaheda Niloufer	**Dr. Shaheda Niloufer**	**Dr. Shaheda Niloufer**	**Dr. T. Satyanarayana**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Mr. Manoj Kumar. M, Mr. P. Mohanaganga Raju
Course Name & Code : 23CE52 - SURVEYING LAB   **Regulation**: R23
L-T-P Structure : 0-0-3   **Credits:** 1.5
Program/Sem/Sec : B.Tech-Civil-III Sem   **A.Y.:** 2025-26

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

By the end of this course student will be able to

1. Know about various linear and angular measuring instruments

2. Take Measurements in the linear and angular view

3. Determine the area and volume by interpreting the data obtained from surveying activities

4. Know modern equipment such as total station

5. Draft field notes from survey data

COURSE OUTCOMES (COs):
Upon the successful completion of this course, the students will able to:
1. Handle various linear and angular measuring instruments
2. Measure the linear and angular measurements
3. Calculate the area and volume by interpreting the data obtained from surveying activities
4. Handle modern equipment such as total station
5. Prepare field notes from survey data

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

TEXTBOOKS:
T1 R. Agor "A Text Book of Surveying and Leveling", Khanna Publishers, New Delhi, 1998.
T2 Punmia B.C., "Surveying Vol I and II", Laxmi Publications 9th, 10th Edition, 1987.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	HOD Sign Weekly
1.	Chain survey of road profile with offsets in case of road widening.	3	08-07-2025 11-07-2025		
2.	Determination of distance between two inaccessible points by using compass.	3	15-07-2025 18-07-2025		
3.	Plane table survey; finding the area of a given boundary by the method of Radiation	3	22-07-2025 25-07-2025		
4.	Fly levelling: Height of the instrument method (differential leveling)	3	29-07-2025 01-08-2025		
5.	Fly levelling: rise and fall method.	3	05-08-2025 08-08-2025		
6.	Theodolite survey: determining the horizontal and vertical angles by the method of repetition method	3	12-08-2025 19-08-2025		
7.	Theodolite survey: finding the distance between two in accessible points.	3	26-08-2025 29-08-2025		
8.	Theodolite survey: finding the height of far object	3	09-08-2025 12-08-2025		
9.	Determination of distance between two inaccessible point by using total station	3	16-08-2025 19-08-2025		
10.	Determination of area perimeter using total station	3	03-08-2025 14-08-2025		
11.	Setting out a curve	3	21-08-2025 24-08-2025		
12.	Determining the levels of contours	3	31-08-2025		

Batches

BATCH: A (Tuesday)	BATCH: B (Friday)
23761A0101, 24761A0101 to 24761A0136	24761A0137 to 24761A0158, LEs

LAB TIMETABLE

Day	FN	AN
Monday		
Tuesday		III Semester Batch- B
Wednesday		
Thursday		
Friday	III Semester Batch- A	
Saturday		

ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	30-06-2025	23-08-2025	8 W
I Mid Examinations	25-08-2025	30-08-2025	1 W
II Phase of Instructions	01-09-2025	01-11-2025	9 W
II Mid Examinations	03-11-2025	08-11-2025	1 W
Preparation and Practical	10-11-2025	15-11-2025	1 W
Semester End Examinations	17-11-2025	29-11-2025	2 W

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work = **A**	1,2,3,4,5,6,7,8…	A=05
Record = **B**	1,2,3,4,5,6,7,8	B=05
Internal Test = **C**	1,2,3,4,5,6,7,8	C = 05
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8	**15**
Semester End Examinations = D	1,2,3,4,5,6,7,8	**D = 35**
Total Marks: A + B + C + D = 50	1,2,3,4,5,6,7,8	**50**

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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PO 3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
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PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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PO 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 analyze and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyze 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	Module Coordinator	Head of the Department
Name of the Faculty	M.Manoj Kumar	Dr C.Rajamallu	Dr C.Rajamallu	Dr. K. V. Ramana
Signature				

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr K.V.Ramana/P. Keerthi

Course Name & Code	: Strength of Materials Lab & 23CE53	**Regulation:** R23	
L-T-P Structure	: 0-0-3	**Credits**	: 1.5
Program/Sem	: B. Tech / III-Sem	**A.Y.**	: 2025-26

Pre-requisites: NIL

Course objectives: By the end of this course student will be able to

1. To determine the tensile strength and yield parameters of mild steel
2. To find out flexural strengths of Steel/Wood specimens and measure deflections
3. To determine the torsion parameters of mild steel bar
4. To determine the hardness numbers, impact and shear strengths of metals
5. To determine the load-deflection parameters for springs

Course Out comes: At the end of the course, the student will be able to:

CO1: Conduct tensile strength test and draw stress-strain diagrams for ductile metals **(Apply)**

CO2: Perform bending test and determine load-deflection curve of steel/wood **(Apply)**

CO3: Able to conduct torsion test and determine torsion parameters **(Apply)**

CO4: Perform hardness, impact and shear strength tests and calculate hardness numbers, impact and shear strengths **(Apply)**

CO5: Able to conduct tests on closely coiled and open coiled springs and calculate deflections **(Apply)**

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

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

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DEPARTMENT OF CIVIL ENGINEERING

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

List of Experiments

Cycle-I

1. Tension test.
2. Bending test on (Steel/Wood) Cantilever beam.
3. Bending test on simply supported beam.
4. Torsion test.
5. Hardness test.

Cycle-II

6. Tension test on Closely coiled springs.
7. Compression test on wood/ concrete.
8. Izod / Charpy Impact test on metals.
9. Bending test on overhanging beam.
10. Continuous beam – deflection test.

Batches

BATCH: A (Tuesday)	BATCH: B (Friday)
A_1------- 23761A0121to 24761A0106	B_1------ 24761A0137 to 24761A0144
A_2------- 24761A0107 to 24761A0113	B_2------- 24761A0145 to 24761A0151
A_3------- 24761A0114 to 24761A0121	B_3-------- 24761A0152 to 24761A0158
A_4--------- 24761A0122 to 24761A0128	B_4--------LE 1 to LE 7
A_5--------- 24761A0129 to 24761A0136	B_5--------LE 8 to LE 14

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DEPARTMENT OF CIVIL ENGINEERING

I CYCLE SCHEDULE: BATCH-A (Tuesday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
01-07-2025		Demo	Demo	Demo	Demo	Demo
08-07-2025		A_1	A_2	A_3	A_4	A_5
15-07-2025		A_5	A_1	A_2	A_3	A_4
22-07-2025		A_4	A_5	A_1	A_2	A_3
29-07-2025		A_3	A_4	A_5	A_1	A_2
05-08-2025		A_2	A_3	A_4	A_5	A_1
12-08-2025		A_1	A_2	A_3	A_4	A_5
19-08-2025		*REPITATION LAB*				

I CYCLE SCHEDULE: BATCH-B (Friday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
04-07-2025		Demo	Demo	Demo	Demo	Demo
11-07-2025		B_1	B_2	B_3	B_4	B_5
18-07-2025		B_5	B_1	B_2	B_3	B_4
25-07-2025		B_4	B_5	B_1	B_2	B_3
01-08-2025		B_3	B_4	B_5	B_1	B_2
08-08-2025		B_2	B_3	B_4	B_5	B_1
22-08-2025		*REPITATION LAB*				

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II CYCLE SCHEDULE: BATCH-A (Tuesday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
02-09-2025		A_1	A_2	A_3	A_4	A_5
09-09-2025		A_5	A_1	A_2	A_3	A_4
16-09-2025		A_4	A_5	A_1	A_2	A_3
23-09-2025		A_3	A_4	A_5	A_1	A_2
07-10-2025		A_2	A_3	A_4	A_5	A_1
14-10-2025		*REPITATION LAB*				
28-10-2025		*INTERNAL TEST*				

II CYCLE SCHEDULE: BATCH-B (Friday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
05-09-2025		B_1	B_2	B_3	B_4	B_5
12-09-2025		B_5	B_1	B_2	B_3	B_4
19-09-2025		B_4	B_5	B_1	B_2	B_3
26-09-2025		B_3	B_4	B_5	B_1	B_2
10-10-2025		B_2	B_3	B_4	B_5	B_1
17-10-2025		*REPITATION LAB*				
24-10-2025		*REPITATION LAB*				
31-10-2025		*INTERNAL TEST*				

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DEPARTMENT OF CIVIL ENGINEERING

LAB TIMETABLE

Day	FN	AN
Monday		
Tuesday		III Semester Batch- A
Wednesday		
Thursday		
Friday	III Semester Batch- B	
Saturday		

Batch – A: 23761A0121 to 24761A0136

Batch – B: 24761A0137 to LE-14

ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	30-06-2025	23-08-2025	8 W
I Mid Examinations	25-08-2025	30-08-2025	1 W
II Phase of Instructions	01-09-2025	01-11-2025	9 W
II Mid Examinations	03-11-2025	08-11-2025	1 W
Preparation and Practical	10-11-2025	15-11-2025	1 W
Semester End Examinations	17-11-2025	29-11-2025	2 W

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Expt. no's	Marks
Day to Day work = **A**	1,2,3,4,5,6,7,8…	A = 10
Record = **B**	1,2,3,4,5,6,7,8	B = 05
Internal Test / Viva = **C**	1,2,3,4,5,6,7,8	C = 15
Cumulative Internal Examination: A + B + C = 30	1,2,3,4,5,6,7,8	**30**
Semester End Examinations = D **Procedure: 20 M; Experimental Work & Results: 30 M; Viva – Voce: 20 M**	1,2,3,4,5,6,7,8	**D = 70**
Total Marks: A + B + C + D = 100	1,2,3,4,5,6,7,8	**100**

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PART-D

PROGRAMME OUTCOMES (POs):

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PO 3	**Design/development of solutions**: Design solutions for complex engineering problems anddesign 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 researchmethods 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 modernengineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
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PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage inindependent and life-long learning in the broadest context of technological change.

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyze 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

Course Instructor	**Module Coordinator**	**HOD**
Dr K.V.Ramana P. Keerthi	Dr. Ch. Rajamallu	Dr. K.V.Ramana

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)
Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution
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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: B Rama Krishna/P M Ganga Raju/P Keerthi
Course Name & Code   : Building Planning and Drawing & 23CES1
L-T-P Structure   **: 0-1-2**   **Credits:** 2
Program/Sem/Sec   : B.Tech, III SEM- Civil   **A.Y.:** 2025-26

PREREQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs):

1. Initiating the student to different building bye-laws and regulations.
2. Imparting the planning aspects of residential buildings and public buildings.
3. Giving training exercises on various signs and bonds.
4. Giving training exercises on different building units.
5. Imparting the skills and methods of planning of various buildings.

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

CO1:	Draw signs and bonds **(Remember)**
CO2:	Draw different building units **(Remember)**
CO3:	Plan various buildings as per the building by-laws. **(Apply)**
CO4:	Learn the skills of drawing building elements and plan the buildings as per requirements. **(Apply)**

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

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

Textbooks:

1. Planning, designing and Scheduling, Gurcharan Singh and Jagdish Singh
2. Building drawing, M G Shah, C M Kale and S Y Patki, Tata McGraw Hill, NewDelhi.

Reference Books:

1. National Building Code 2016 (Volume- I & II).
2. Building planning and drawing by M. Chakraborti.
3. Principles of Building Drawing, M G Shah and C M Kale, Trinity Publications, New Delhi.
4. Civil Engineering drawing and House planning, B. P. Verma, Khanna publishers, NewDelhi.

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
1.	Introduction CO's & PO's Basic drawing practices	3	30-06-2025		TLM4	
2.	Sign conventions	1	05-07-2025		TLM2	
3.	Week1: Detailing & Drawing of Sign Conventions.	3	07-07-2025		TLM4	
4.	English bond	1	12-07-2025		TLM2	
5.	Week 2: Detailing & Drawing of English Bond.	3	14-07-2025		TLM4	
6.	Flemish bond	1	19-07-2025		TLM2	
7.	Week 3: Detailing & Drawing of Flemish Bond.	3	21-07-2025		TLM4	
8.	Introduction to doors	1	26-07-2025		TLM2	
9.	Week 4: Detailing & Drawing of Doors.	3	28-03-2025		TLM4	
10.	Ventilators & Roofs	1	02-08-2025		TLM2	
11.	Week 5: Detailing & Drawing of Windows.	3	04-08-2025		TLM4	
12.	Building Bye- Laws	1	09-08-2025		TLM2	
13.	Week 6: Detailing & Drawing of Ventilators & Roofs.	3	11-08-2025		TLM4	
14.	Week 7: Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws. **Plan-1**	3	18-08-2025		TLM4	
15.	Building Bye- Laws	1	23-08-2025		TLM2	
16.	Week 8: Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws. **Plan-2**	3	01-09-2025		TLM4	
17.	Building Bye- Laws	1	06-09-2025		TLM2	
18.	Week 9: Drawing of Plan, Elevation & Section for Hospital Building. **Plan-3**	3	08-09-2025		TLM4	
19.	Building Bye- Laws	1	13-09-2025		TLM2	
20.	Week 10: Drawing of Plan, Elevation & Section for Hospital Building. **Plan-4**	3	15-09-2025		TLM4	
21.	Building Bye- Laws	1	20-09-2025		TLM2	
22.	Week 11: Drawing of Plan, Elevation & Section for Industrial Building. **Plan-5**	3	22-09-2025		TLM4	
23.	Revision		04-10-2025 06-10-2025 13-10-2025 18-10-2025 25-10-2025		TLM2 TLM4	
24.	LAB INTERNAL EXAM	3	27-10-2025			

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
Day-to-day work	10
Record	05
Internal Test	15
Continuous Internal Evaluation (CIE)	**30**
Semester End Examination (SEE)	**70**
Total Marks = CIE+SEE	**100**

PART-D

PROGRAMME OUTCOMES (POs):

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	B RAMA KRISHNA	B RAMA KRISHNA	Dr C Rajamallu	Dr K V Ramana
Signature				