



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., III-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	14-07-2026		TLM1			
2.	Course Outcomes, Program Outcomes	1	16-07-2026		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	17-07-2026		TLM1	CO1	T1,T2	
4.	Bisection method	1	18-07-2026		TLM1	CO1	T1,T2	
5.	Method of false position	1	21-07-2026		TLM1	CO1	T1,T2	
6.	Secant method	1	23-07-2026		TLM1	CO1	T1,T2	
7.	Iteration method	1	24-07-2026		TLM1	CO1	T1,T2	
8.	Newton-Raphson method	1	25-07-2026		TLM1	CO1	T1,T2	
9.	Newton-Raphson method (simultaneous equations)	1	28-07-2026		TLM1	CO1	T1,T2	
10.	TUTORIAL - I	1	30-07-2026		TLM3	CO1	T1,T2	
11.	Newton's forward formula for interpolation	1	31-07-2026		TLM1	CO1	T1,T2	
12.	Newton's forward formula for interpolation	1	01-08-2026		TLM1	CO1	T1,T2	
13.	Newton's backward formula for interpolation	1	04-08-2026		TLM1	CO1	T1,T2	
14.	Lagrange's interpolation formula	1	06-08-2026		TLM1	CO1	T1,T2	
15.	Lagrange's interpolation formula	1	07-08-2026		TLM1	CO1	T1,T2	
16.	TUTORIAL - II	1	11-08-2026		TLM3	CO1	T1,T2	
No. of classes required		12			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
17.	Introduction to Unit – II	1	13-08-2026		TLM1	CO2	T1,T2	
18.	Trapezoidal Rule	1	14-08-2026		TLM1	CO2	T1,T2	
19.	Simpson’s 1/3 Rule	1	18-08-2026		TLM1	CO2	T1,T2	
20.	Simpson’s 3/8 Rule	1	20-08-2026		TLM1	CO2	T1,T2	
21.	TUTORIAL - III	1	21-08-2026		TLM3	CO2	T1,T2	
22.	Taylor Series Method	1	22-08-2026		TLM1	CO2	T1,T2	
23.	Picard’s Method	1	25-08-2026		TLM1	CO2	T1,T2	
24.	Euler’s Method	1	27-08-2026		TLM1	CO2	T1,T2	
25.	Runge Kutta Second order method	1	28-08-2026		TLM1	CO2	T1,T2	
26.	Runge Kutta Fourth order method	1	29-08-2026		TLM1	CO2	T1,T2	
27.	Milne’s Predictor and Corrector method	1	01-09-2026		TLM1	CO2	T1,T2	
28.	Milne’s Predictor and Corrector method	1	03-09-2026		TLM1	CO2	T1,T2	
29.	TUTORIAL - IV	1	05-09-2026		TLM3	CO2	T1,T2	
No. of classes required		11			No. of classes taken:			

I MID EXAMINATIONS (07-09-2026 to 09-09-2026)**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
30.	Introduction	1	10-09-2026		TLM1	CO3	T1,T2	
31.	Baye’s theorem, problems	1	11-09-2026		TLM1	CO3	T1,T2	
32.	Random variables, Expectations	1	15-09-2026		TLM1	CO3	T1,T2	
33.	Problems on PMF	1	17-09-2026		TLM1	CO3	T1,T2	
34.	Problems on PDF	1	18-09-2026		TLM1	CO3	T1,T2	
35.	Binomial distribution	1	19-09-2026		TLM1	CO3	T1,T2	
36.	Poisson distribution	1	22-09-2026		TLM1	CO3	T1,T2	
37.	Uniform distribution	1	24-09-2026		TLM1	CO3	T1,T2	
38.	Normal distribution	1	25-09-2026		TLM1	CO3	T1,T2	
39.	TUTORIAL – V	1	26-09-2026		TLM3	CO3	T1,T2	
No. of classes required		9			No. of classes taken:			

UNIT-IV: Sampling Theory

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
40.	Introduction	1	29-09-2026		TLM1	CO4	T1,T2	
41.	Sampling distribution, definitions	1	01-10-2026		TLM1	CO4	T1,T2	
42.	Sampling distribution of mean, variance	1	03-10-2026		TLM1	CO4	T1,T2	
43.	Problems	1	06-10-2026		TLM1	CO4	T1,T2	
44.	Problems on central limit theorem	1	08-10-2026		TLM1	CO4	T1,T2	
45.	Estimation	1	09-10-2026		TLM1	CO4	T1,T2	
46.	Point and interval estimation	1	13-10-2026		TLM1	CO4	T1,T2	
47.	Estimation using t distribution	1	15-10-2026		TLM1	CO4	T1,T2	
48.	Estimation using χ^2 and F-distributions	1	16-10-2026		TLM1	CO4	T1,T2	
49.	Tutorial-VI	1	17-10-2026		TLM3	CO4	T1,T2	
No. of classes required		9			No. of classes taken:			

UNIT-V: Test of Hypothesis

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	27-10-2026		TLM1	CO5	T1,T2	
2.	Z-test for means	1	29-10-2026		TLM1	CO5	T1,T2	
3.	Z-test for means	1	30-10-2026		TLM1	CO5	T1,T2	
4.	Z-test for proportions	1	31-10-2026		TLM1	CO5	T1,T2	
5.	Z-test for proportions	1	03-11-2026		TLM1	CO5	T1,T2	
6.	t-test for means	1	05-11-2026		TLM1	CO5	T1,T2	
7.	F-test for variances	1	06-11-2026		TLM1	CO5	T1,T2	
8.	χ^2 -test for goodness of fit	1	07-11-2026		TLM1	CO5	T1,T2	
9.	χ^2 -test for independence of attributes	1	10-11-2026		TLM1	CO5	T1,T2	
10.	Tutorial-VII	1	10-11-2026		TLM3	CO5	T1,T2	
No. of classes required		9			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	11-08-2026		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

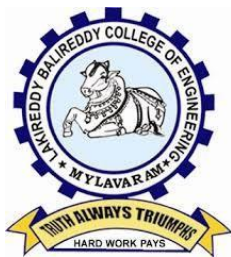
PART-C EVALUATION PROCESS (R23 Regulation):

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.

Mrs. K. N. V. Lakshmi	Mrs. 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: Mrs. P. Keerthi

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.** : 2026-27

PRE REQUISITE : 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** RR Gaur, rsingal, GP Bagaria, "Human values and Professional Ethics", Excel Books, New Delhi, 2010

REFERENCE BOOKS:

- R1** Jeevanvidya: 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 (LESSONPLAN):

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	13-07-2026		TLM2	
2.	Process for self exploration: Natural Acceptance	1	15-07-2026		TLM.2	
3.	Right Understanding, Relationship and Physical Facility	2	16-07-2026 17-07-2026		TLM2	
4.	Understanding Value Education	1	20-07-2026		TLM2	
5.	self-exploration as the Process for Value Education	1	22-07-2026		TLM2	
6.	Continuous Happiness and Prosperity	2	23-07-2026 24-07-2026		TLM2	
7.	Happiness and Prosperity	1	27-07-2026		TLM2	
8.	Method to Fulfill the Basic Human Aspirations	1	29-07-2026		TLM2	
9.	Tutorial-1	1	30-07-2026		TLM2	
10.	Tutorial-2	1	31-07-2026		TLM2	
11.	Exploring Natural Acceptance	1	21-07-2026		TLM2	
No. of classes required to complete UNIT-I: 13				No. f 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
12.	Understanding Human being as the Co-existence of the self and the body	1	03-08-2026		TLM2	
13.	Distinguishing between the Needs of the self and the body	2	05-08-2026 & 06-08-2026		TLM2	
14.	The body as an Instrument of the self	1	07-08-2026		TLM2	
15.	Understanding Harmony in the self	2	10-08-2026 & 12-08-2026		TLM2	
16.	Harmony of the self with the body	1	13-08-2026		TLM2	
17.	Programme to ensure self-regulation and Health	1	14-08-2026		TLM2	
18.	Tutorial-1	1	17-08-2026		TLM2	
19.	Tutorial-2	1	19-08-2026		TLM1	

20.	Exploring sources of imagination in the self	1	20-08-2026		TLM2	
21.	Exploring Harmony of self with the body	1	21-08-2026		TLM2	
No. of classes required to complete UNIT-II:12				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
22.	Harmony in the Family	2	24-08-2026 & 27-08-2026		TLM2	
23.	'Trust'– the Foundational Value in Relationship	1	28-08-2026		TLM2	
24.	Practice Session PS7 Exploring the Feeling of Trust	1	31-08-2026		TLM2	
25.	'Respect'– as the Right Evaluation	1	02-09-2026		TLM1	
26.	PracticeSessionPS8 Exploring the Feeling of Respect	2	03-09-2025 & 10-09-2026		TLM2	
27.	Other Feelings, Justice in Human-to-Human Relationship	1	11-09-2026		TLM2	
28.	Understanding Harmony in the Society	2	16-09-2026 & 17-09-2026		TLM2	
29.	Vision for the Universal Human Order	1	18-09-2026		TLM2	
30.	Exploring systems to fulfil human goal	1	21-09-2026		TLM2	
31.	Tutorial	1	23-09-2026		TLM2	
No. of classes required to complete UNIT-III:13				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
32.	Understanding Harmony in the Nature	2	24-09-2026 25-09-2026		TLM2	
33.	Interconnectedness, self-regulation	1	28-09-2026		TLM2	
34.	Mutual Fulfilment among the Four Orders of Nature	1	30-09-2026		TLM2	
35.	Realizing Existence as Co-existence at All Levels	2	01-10-2026 & 05-10-2026		TLM2	
36.	The Holistic Perception of Harmony in Existence	2	07-10-2026 08-10-2026		TLM2	
37.	Tutorial-1	2	09-10-2026 12-10-2026		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
38.	Natural acceptance of human values	1	14-10-2026		TLM2	
39.	Definitiveness of ethical human conduct	1	15-10-2026		TLM2	
40.	Basis for humanistic education	1	16-10-2026		TLM2	
41.	A Basis for Humanistic Education, Humanistic	2	26-10-2026 28-10-2026		TLM2	
42.	Constitution and Universal Human	1	29-10-2026		TLM2	
43.	Competence in professional ethics	1	30-10-2026		TLM2	
44.	Strategy for transition from the present state to universal human order	2	02-11-2026 04-11-2026		TLM2	
45.	Holistic Technologies, Production Systems and Management Models- Typical Case	2	05-11-2026 06-11-2026		TLM2	
46.	Exploring steps of transition towards Universal Human Order	2	09-11-2026 11-11-2026		TLM2	
No. of classes required to complete UNIT-V:13				No. of classes taken:		

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

PART-C

EVALUATION PROCESS R23Regulation):

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-DescriptiveExamination(UNIT-III(RemainingHalfoftheSyllabus),IV& V)	M2=15
II-Quiz Examination(UNIT-III(Remaining Half of the Syllabus),IV&V)	Q2=10
MidMarks=80%ofMax((M1+Q1+A1),(M2+Q2+A2))+20%ofMin((M1+Q1+A1),(M2+Q2+A2))	M=30
CumulativeInternalExamination(CIE):M	30
SemesterEndExamination(SEE)	70
Total Marks=CIE+SEE	100

PART-D

PROGRAMME OUTCOMES(POs):

P01	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
P02	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.
P03	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.
P04	Conduct investigation 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.
P05	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
P06	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
P07	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.
P08	Ethics Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
P09	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

P010	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.
P011	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.
P012	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

ACADEMIC CALENDAR: A.Y 2026-27

Description	From	To	Weeks
I Phase of Instructions	13-07-2026	05-09-2026	8W
I Mid Examinations	07-09-2026	09-09-2026	3 Days
II Phase of Instructions	19-09-2026	11-11-2026	9W
II Mid Examinations	12-11-2026	16-11-2026	3 Days
Preparation and Practical	16-11-2026	21-11-2026	1 W
Semester End Examinations	23-11-2026	05-12-2026	2 W

Signature				
Name of the Faculty	Mrs. P.Keerthi			Dr.K V Ramana.
Title	Course Instructor		Module Coordinator	Head of the Department



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr. Eeshwar Ram J
Course Name & Code : SURVEYING & 23CE01
L-T-P Structure : 03-0-0
Program/Sem/Sec : B.Tech/III Sem

Regulation: R23

Credits: 03

A.Y.: 2026-27

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		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	14-07-2026		TLM2	
2.	Introduction to Unit-I	1	15-07-2026		TLM2	
3.	Objectives, Classification and principles of surveying	1	16-07-2026		TLM2	
4.	Surveying accessories	1	18-07-2026		TLM2	
5.	Compass- Survey-Introduction	1	21-07-2026		TLM2	
6.	leveling	1	22-07-2026		TLM2	
7.	Plane table surveying	1	23-07-2026		TLM2	
8.	Linear distances- Approximate methods, Direct Methods-	1	25-07-2026		TLM1	
9.	Chains- Tapes, ranging, Tape corrections	1	28-07-2026			
10.	Prismatic Compass- Bearings, included angles,	1	30-07-2026		TLM1	
11.	W.C.B and Q.B systems of locating bearings.	1	01-08-2026			
12.	Local Attraction, Magnetic Declination, and dip – systems	1	04-08-2026		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	04-08-2026		TLM2	
2.	Determination of levels.	1	05-08-2026		TLM1	
3	Effect of Curvature of Earth	1	06-08-2026		TLM3	
4.	Effect of Refraction	1	08-08-2026		TLM2	
5.	Contouring- Characteristics	1	11-08-2026		TLM2	
6.	uses of Contours, methods of contour surveying.	1	12-08-2026		TLM2	
7.	Areas - Determination of areas consisting of irregular boundary and regular boundaries	1	14-08-2026		TLM1	
8.	Problems	1	18-08-2026		TLM3	
9	Volumes -Determination of volume of earth work in cutting and	1	19-08-2026			
10	Problems	1	20-08-2026		TLM1	
11	TUTORIAL-3	1	22-08-2026		TLM3	
12	Embankments for level section, capacity of reservoirs.	1	25-08-2026		TLM2	
No. of classes required to complete UNIT-II:10				No. of classes taken:10		

UNIT-III: THEODOLITE SURVEYING AND TRAVERSING

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	27-08-2026		TLM2	
2.	measurement of horizontal angle by repetition method	1	29-08-2026		TLM1	
3.	and reiteration method		01-09-2026			
4.	measurement of vertical Angle,	1	02-09-2026		TLM1	
5.	Trigonometrical leveling when base is accessible and inaccessible.	1	03-09-2026		TLM1	
6.	TUTORIAL-1	1	05-09-2026		TLM3	
7	Traversing: Methods of traversing,	1	10-09-2026		TLM1	
8.	traverse computations and adjustments,		12-09-2026		TLM3	
9.	TUTORIAL-2	1	15-09-2026		TLM1	
10.	Introduction to Omitted measurements.	1	16-09-2026		TLM3	
11.	Problems	1	17-09-2026		TLM3	
12.	Problems	1	19-09-2026		TLM3	
13	TUTORIAL-3	1	22-09-2026		TLM3	
No. of classes required to complete UNIT-III:11					No. of classes taken:	

UNIT-IV: CURVES AND MODERN SURVEYING METHODS

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	23-09-2026		TLM1	
2.	elements of simple, compound, reverse curves	2	24-09-2026 26-09-2026		TLM1	
3	Problems	1	29-09-2026		TLM3	
3.	Introduction to Tacheometric Surveying.	1	30-09-2026		TLM2	
4.	Problems	1	01-10-2026		TLM3	
5.	Tutorial-I	1	03-10-2026		TLM3	
6.	Introduction-Modern Surveying Methods:	1	06-10-2026		TLM2	
7.	Total station- advantages and Applications.	1	07-10-2026		TLM2	
8.	Introduction to Global Positioning System.	1	10-10-2026		TLM2	
9.	Introduction to Drone survey	1	13-10-2026		TLM2	
10.	LiDAR Survey (Light Detection and Ranging).	1	14-10-2026		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	15-10-2026		TLM2	
2.	perspective geometry of aerial photograph,	1	17-10-2026		TLM2	
3.	relief and tilt displacements,	1	26-10-2026		TLM2	
4.	terrestrial photogrammetry, flight planning;	1	27-10-2026		TLM2	
5.	Stereoscopy, ground control extension for photographic mapping-	1	28-10-2026		TLM2	
6.	aerial triangulation,	1	29-10-2026		TLM2	
7.	radial triangulation methods.		31-10-2026			
8.	photographic mapping-mapping using paper prints,	1	03-11-2026		TLM2	
9.	mapping using stereo-	1	04-11-2026		TLM2	
10.	plotting instruments, mosaics,	1	07-11-2026		TLM2	
11.	map substitutes	1	10-11-2026		TLM2	
12	tutorials	1	11-11-2026		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

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=1
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=1
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),	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	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	Eeshwar Ram J			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	
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 : 2026-27
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 Lamé'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
C01	2	1										2	2		
C02	3	1										2	2		
C03	3	1										2	2		
C04	3	2										2	2		
C05	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, 3rd Edition.
- 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

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	13-07-2026		1	
2.	Introduction to Strength of Materials	1	15-07-2026		1	
3.	Mechanical Properties of Materials	1	16-07-2026		1	
4.	Types of stresses and strains	1	18-07-2026		1	
5.	Stress strain diagram and Hooks law	1	20-07-2026		1,2	
6.	Problems on Stress strain Relationship	1	22-07-2026		1	
7.	Analysis of Varying bars	1	23-07-2026		1	
8.	Problems on Compound bars	1	25-07-2026		1	
9.	Relation between Elastic constants	1	27-07-2026		1	
10.	Stresses in Composite bars	1	29-07-2026		1	
11.	Stresses in Composite bars	1	30-07-2026		1,6	
No. of classes required to complete UNIT-I: 11				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	01-08-2026		1,2	
2.	Reactions in SS beam with elementary loads	1	03-08-2026		1	
3.	Reactions in SS beam with elementary loads	1	05-08-2026		1	
4.	Reactions in cantilever beam with elementary loads	1	06-08-2026		1	

5.	SFD and BMD in Cantilever beam with UDL and point load	1	08-08-2026		1	
6.	SFD and BMD in Cantilever beam with Partial UDL and varying loads	1	10-08-2026		1	
7.	SFD and BMD in SS beam with UDL and point load	2	12-08-2026 13-08-2026		1	
8.	SFD and BMD in SS beam with Partial UDL and varying loads	2	17-08-2026 29-08-2026		1	
9.	SFD and BMD of Cantilever beam with combined loading	2	20-08-2026 22-08-2026		1,2	
10.	SFD and BMD of Cantilever beam with combined loading	2	24-08-2026 27-08-2026		1,2	
11.	SFD and BMD of SS beam with combined loading	2	29-08-2026 31-08-2026		1	
12.	SFD and BMD of SS beam with combined loading	1	02-09-2026		1,6	
13.	Relation B/W shear force loading and BMD - Loading	1	03-09-2026		1	
No. of classes required to complete UNIT-II: 18				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	05-09-2026		1,2	
2.	Finding bending stress in rectangular section	1	10-09-2026		1	
3.	Finding bending stress in I,T section	1	12-09-2026		1	
4.	Design of simple beam for bending	1	16-09-2026		1	
5.	Horizontal shear stress derivation	1	17-09-2026		1,2	
6.	Horizontal shear stress in Rec. sec	1	19-09-2026		1,2	
7.	Horizontal shear stress in Circular and Triangular sec	1	21-09-2026		1,2	
8.	Horizontal shear stress in I section	1	23-09-2026		1,2	
9.	Torsion formula Derivation	1	24-09-2026		1	
10.	Problems on finding shear stress in shafts	1	26-09-2026		1	
11.	Problems on finding power transmitted in shafts	1	28-09-2026		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	30-09-2026		1,2	
2.	Double integration method application to Cantilever beam loadings	1	01-10-2026		1	
3.	Double integration method application to Cantilever beam loadings	1	03-10-2026		1	
4.	Double integration method application to simply supported beam loadings	1	05-10-2026		1	
5.	Macaulay's method application to simply supported beam loadings	1	07-10-2026		1	
6.	Macaulay's method application to simply supported beam loadings	1	08-10-2026		1	
7.	Moment area method application to find deflections in cantilevers	1	10-10-2026		1	
8.	Moment area method application to find deflections in SS beam	1	12-10-2026		1	
9.	Moment area method application to find deflections in SS beam	1	14-10-2026		1,6	
No. of classes required to complete UNIT-II: 09				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	15-10-2026		1,2	
2.	Critical load for both ends hinged and fixed support conditions of columns	1	17-10-2026		1,2	
3.	Critical load for one end hinged/free and other end fixed	1	26-10-2026		1,2	
4.	Slenderness ratio and Limitation of Euler's theorem	1	28-10-2026		1,2	
5.	Rankine – Gordon formula and application	1	29-10-2026		1,2	
6.	Eccentric loading and Secant formula	1	31-10-2026		1,2	
7.	Longitudinal and circumferential stresses	1	02-11-2026		1	
8.	Hoop, longitudinal and volumetric strains	1	04-11-2026		1	
9.	Changes in volume of cylinder	1	05-11-2026		1,6	
10.	Lames theory for thick	1	07-11-2026		1	
11.	Stresses in thick cylinders	1	09-11-2026		1	

12.	Compound cylinders	1	11-11-2026		1	
No. of classes required to complete UNIT-IV: 12				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	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 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				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(Autonomous)

Approved by AICTE, New Delhi and Permanently Affiliated to JNTUK, Kakinada
Accredited by NAAC with "A" Grade and NBA (CSE, IT, ECE, EEE & ME) under Tier-I



College Code:

76

DEPARTMENT OF CIVIL ENGINEERING COURSE HANDOUT

PART-A

Name of Course Instructor : J.Rangaiah
Course Name & Code : FLUID MECHANICS (23CE03)
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : CIVIL., III-Sem. A.Y : 2026-27

Prerequisite: 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 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 Out comes: At the end of the course, the student 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	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	-	-	-	-	-	-	-	-	-	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=Slight(low) 2=Moderate (Medium) 3=Substantial (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 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

Online Learning Resources:

<https://archive.nptel.ac.in/courses/112/105/112105269/>

<https://nptel.ac.in/courses/112104118>

<https://nptel.ac.in/courses/105103192>

PART-B
COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Basic concepts and definitions: Distinction between a fluid and a solid	1	13-07-26		TLM1	CO1	T1	
2.	Density, Specific weight, Specific gravity	1	15-07-26		TLM1	CO1	T1	
3.	Kinematic and dynamic viscosity; Variation of viscosity with temperature, Newton law of viscosity	1	16-07-26		TLM1	CO1	T1	
4.	Problems	1	18-07-26		TLM1	CO2	T1	
5.	Problems	1	20-07-26		TLM1	CO2	T1	
6.	Vapor pressure, Boiling point, Surface tension, Capillarity, Bulk modulus of elasticity, Compressibility.	1	22-07-26		TLM1	CO1	T1	
7.	Problems	1	23-07-26		TLM1	CO2	T1	

8.	Problems	1	25-07-26		TLM1	CO2	T1	
9.	Fluid Pressure: Pressure at a point, Pascal's law pressure variation with temperature, density and altitude.	1	27-07-26		TLM1	CO1	T1	
10.	Piezometer, U-Tube Manometer, Single Column Manometer, U Tube Differential Manometer. Pressure gauges,	1	29-07-26		TLM1	CO1	T1	
11.	Problems	1	30-07-26		TLM1	CO2	T1	
12.	Problems	2	01-08-26		TLM1	CO2	T1	
13.	Problems	1	3-08-26		TLM1	CO2	T1	
No. of classes required to complete UNIT-I				No. of classes taken:				

UNIT-II:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
14.	Fluid statics: Hydrostatic pressure and force: horizontal surfaces.	1	5-08-26		TLM1	CO1	T1	
15.	pressure and force: vertical surfaces.	1	6-08-26		TLM1	CO1	T1	
16.	Problems	1	8-08-26		TLM1	CO2	T1	
17.	Problems	1	10-08-26		TLM1	CO2	T1	
18.	pressure and force: inclined surfaces.	1	12-08-26		TLM1	CO1	T1	
19.	Problems	1	13-08-26		TLM1	CO2	T1	
20.	Problems	1	17-08-26		TLM1	CO2	T1	
21.	Buoyancy and stability of floating bodies	1	19-08-26		TLM1	CO1	T1	
22.	Center of Buoyancy, Metacenter, Conditions of Equilibrium for floating bodies and submerged bodies.	1	20-08-26		TLM1	CO1	T1	
23.	Problems	1	22-08-26		TLM1	CO2	T1	
24.	Problems	1	24-08-26		TLM1	CO2	T1	
No. of classes required to complete UNIT-II				No. of classes taken:				

UNIT-III

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
25.	Classification of fluid flow:	1	27-08-26		TLM1	CO3	T1	
26.	Stream line, path line, streak line and stream tube;	1	29-08-26		TLM1	CO3	T1	
27.	stream function, velocity potential function.	1	31-08-26		TLM1	CO3	T1	
28.	Problems	1	02-09-26		TLM1	CO4	T1	
29.	Problems	1	03-09-26		TLM1	CO4	T1	
30.	Problems	1	05-09-26		TLM1	CO4	T1	
31.	One, two and three - Dimensional continuity equations in Cartesian coordinates.	1	10-09-26		TLM1	CO3	T1	
32.	Problems	1	12-09-26		TLM1	CO4	T1	
33.	Problems	1	16-09-26		TLM1	CO4	T1	
34.	Problems	1	17-09-26		TLM1	CO4	T1	
No. of classes required to complete UNIT-III				No. of classes taken:				

UNIT-IV

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
35.	Fluid Dynamics: Surface and body forces; Equations of motion - Euler 's equation	1	19-09-26		TLM1	CO3	T1	
36.	Bernoulli's equation – Derivation;	1	21-09-26		TLM1	CO4	T1	
37.	Energy Principle; Practical applications of Bernoulli's equation :	1	23-09-26		TLM1	CO3	T1	
38.	Venturimeter,	1	24-09-26		TLM1	CO4	T1	
39.	orifice meter	1	26-09-26		TLM1	CO4	T1	
40.	Pitot tube;	1	28-09-26		TLM1	CO4	T1	
41.	Problems	1	30-09-26		TLM1	CO4	T1	
42.	Problems	1	01-10-26		TLM1	CO4	T1	
43.	Momentum principle; Forces exerted by fluid flow on pipe bend	1	03-10-26		TLM1	CO3	T1	

44.	Free and Forced Vortex Flow – governing equations and applications.	1	12-10-26		TLM1	CO3	T1	
45.	Problems	1	14-10-26		TLM1	CO4	T1	
46.	Problems	1	15-10-26		TLM1	CO4	T1	
No. of classes required to complete UNIT-IV				No. of classes taken:				

UNIT-V

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
47.	Analysis of Pipe Flow: Energy losses in pipelines;	1	17-10-26		TLM1	CO3	T1	
48.	Darcy – Weisbach equation;	1	26-10-26		TLM1	CO3	T1	
49.	Problems	1	28-10-26		TLM1	CO5	T1	
50.	Minor losses in pipelines;	1	29-10-26		TLM1	CO3	T1	
51.	Problems	1	31-10-26		TLM1	CO5	T1	
52.	Hydraulic Grade Line and Total Energy Line;	1	02-11-26		TLM1	CO3	T1	
53.	Concept of equivalent length – Pipes in Parallel and Series.	1	04-11-26		TLM1	CO3	T1	
54.	Problems	1	05-11-26		TLM1	CO5	T1	
55.	Derivations and applications of Reynolds Number, Froude Number,	1	07-11-26		TLM1	CO4	T1	
56.	Derivations and applications of Mach Number, Weber Number	1	09-11-26		TLM1	CO4	T1	
57.	Derivations and applications of Euler Number;	1	11-11-26		TLM1	CO4	T1	
No. of classes required to complete UNIT-V				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:

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

ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	13-07-2026	05-09-2026	8 W
I Mid Examinations	07-09-2026	09-09-2026	3 days
II Phase of Instructions	10-09-2026	17-10-2026	$5\frac{1}{2}$ W
II Phase of Instructions	26-10-2026	11-11-2026	$2\frac{1}{2}$ W
II Mid Examinations	12-11-2026	14-11-2026	3 days
Preparation and Practical's	16-11-2026	21-11-2026	1 W
Semester End Examinations	23-11-2026	05-12-2026	2 W

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 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	Course Coordinator	Module Coordinator	HOD



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & 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., III-Sem., CIVIL
ACADEMIC YEAR	: 2026-27
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, Environmental Studies, 2/e, Pearson education, 2014.
- T3.** S. Azeem Unnisa, Environmental Studies, Academic Publishing Company, 2021.
- T4.** K. Raghavan Nambiar, "Text book of Environmental Studies for Undergraduate Courses as per UGC model syllabus", SciTech Publications (India), Pvt. Ltd, 2010.

Reference Books:

- R1.** KVSG Murali Krishna, The Book of Environmental Studies, 2/e, VGS Publishers, 2011.
- R2.** Deeksha Dave and E. Sai Baba Reddy, Text book of Environmental Science, 2/e, Cengage Publications, 2012.
- R3.** M. Anji Reddy, "Text book of Environmental Sciences and Technology", B S Publication, 2014.
- R4.** J.P. Sharma, Comprehensive Environmental studies, Laxmi publications, 2006.
- R5.** J. Glynn Henry and Gary W. Heinke, Environmental Sciences and Engineering, Prentice Hall of India Private limited, 1988.
- R6.** G.R. Chatwal, A Text Book of Environmental Studies, Himalaya Publishing House, 2018.
- R7.** Gilbert M. Masters and Wendell P. Ela, Introduction to Environmental Engineering 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	15-07-2026		TLM2			
2.	Multidisciplinary Nature of Environmental Studies	1	16-07-2026		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
3.	Natural Resources – Forest resources	1	22-07-2026		TLM1	CO1	T1, T2	
4.	Water resources	1	23-07-2026		TLM2	CO1	T1, T2	
5.	Mineral resources	1	29-07-2026		TLM1	CO1	T1, T2	
6.	Food resources	1	30-07-2026		TLM2	CO1	T1, T2	
7.	Energy resources	1	05-08-2026		TLM2	CO1	T1, T2	
No. of classes required to complete UNIT-I		07			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
8.	Ecosystems – Structure & Functions	1	06-08-2026		TLM4	CO2	T1, T2	
9.	Ecological succession &	1	12-08-2026		TLM1	CO2	T1, T2	
10.	Food chains, Food webs & Ecological Pyramids	1	13-08-2026		TLM4	CO2	T1, T2	

11.	Types of ecosystems	1	19-08-2026		TLM1	CO2	T1, T2	
12.	Biodiversity – introduction, levels, bio geographic classification	1	20-08-2026		TLM2	CO2	T1, T2	
13.	Values of Biodiversity, India as mega diversity nation, Threats to biodiversity and Conservation of biodiversity	1	27-08-2026		TLM2	CO2	T1, T2	
No. of classes required to complete UNIT-II		06			No. of classes taken:			

I MID EXAMINATIONS (07-09-2026 TO 09-09-2026)

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	02-09-2026		TLM1	CO3	T1, T2	
15.	Water pollution, Marine pollution, Thermal pollution	1	03-09-2026		TLM1	CO3	T1, T2	
16.	Soil pollution	1	10-09-2026		TLM1	CO3	T1, T2	
17.	Solid waste management	1	16-09-2026		TLM1	CO3	T1, T2	
18.	Disaster management	1	17-09-2026		TLM1	CO3	T1, T2	
No. of classes required to complete UNIT-III		05			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
19.	From Unsustainable to Sustainable development	1	23-09-2026		TLM1	CO4	T1, T2	
20.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	24-09-2026		TLM1	CO4	T1, T2	
21.	Environmental ethics, Climate change	1	30-09-2026		TLM6	CO4	T1, T2	
22.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	07-10-2026		TLM1	CO4	T1, T2	
23.	Environmental Acts	1	08-10-2026		TLM1	CO4	T1, T2	
24.	Environmental Acts	1	14-10-2026		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
25.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	15-10-2026		TLM1	CO5	T1, T2	
26.	Environment and human health –Human Rights – Value Education	1	28-10-2026		TLM1	CO5	T1, T2	
27.	HIV/AIDS – Women and Child Welfare	1	29-10-2026		TLM1	CO5	T1, T2	
28.	Role of information Technology in Environment and human health	1	04-11-2026		TLM1	CO5	T1, T2	
29.	Revision	1	05-11-2026		TLM3	CO5	T1, T2	
No. of classes required to complete UNIT-V		05			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.	Awareness on ozone layer Case studies	1	19-09-2026		TLM2	CO2	T1, T2	
II MID EXAMINATIONS (12-11-2026 TO 14-11-2026)								

Teaching Learning Methods

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

PART-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

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. J.Rangaiah, Mr. M.Karthik Kumar

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.: 2026-27

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
BATCH: A (Friday)

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	17-07-2026		
2.	Determination of distance between two inaccessible points by using compass.	3	24-07-2026		
3.	Plane table survey; finding the area of a given boundary by the method of Radiation	3	31-07-2026		
4.	Fly levelling: Height of the instrument method (differential leveling)	3	07-08-2026		
5.	Fly levelling: rise and fall method.	3	14-08-2026		
6.	Theodolite survey: determining the horizontal and vertical angles by the method of repetition method	3	21-08-2026		
7.	Theodolite survey: finding the distance between two inaccessible points.	3	28-08-2026		
8.	Theodolite survey: finding the height of far object	3	11-09-2026		
9.	Determination of distance between two inaccessible point by using total station	3	18-09-2026		
10.	Determination of area perimeter using total station	3	25-09-2026		
11.	Setting out a curve (demo)	3	09-10-2026		
12.	Determining the levels of contours (demo)	3	16-10-2026		
13.	Revision	3	30-10-2026		
14.	Internal Test	3	06-11-2026		

PART-B
BATCH: B (Tuesday)

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.	Demo	3	14-07-2026		
2.	Chain survey of road profile with offsets in Case of road widening.	3	21-07-2026		
3.	Determination of distance between two inaccessible points by using compass.	3	28-07-2026		
4.	Plane table survey; finding the area of a given boundary by the method of Radiation	3	04-08-2026		
5.	Fly levelling: Height of the instrument method (differential leveling)	3	11-08-2026		
6.	Fly levelling: rise and fall method.	3	18-08-2026		
7.	Theodolite survey: determining the horizontal and vertical angles by the method of repetition method	3	25-08-2026		
8.	Theodolite survey: finding the distance between two inaccessible points.	3	01-09-2026		
9.	Theodolite survey: finding the height of far object	3	15-09-2026		
10.	Determination of distance between two inaccessible point by using total station	3	22-09-2026		
11.	Determination of area perimeter using total station	3	29-09-2026		
12.	Setting out a curve (demo)	3	06-10-2026		
13.	Determining the levels of contours (demo)	3	13-10-2026		
14.	Revision	3	27-10-2026		
15.	Revision	3	03-10-2026		
16.	Internal Test	3	10-11-2026		

Batches

BATCH: A (Friday)	BATCH: B (Tuesday)
25761A0101 to 25761A0134	25761A0135 to 24761A0156, LEs

LAB TIMETABLE

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

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

Evaluation Task	Expt. no's	Marks
Day to Day work = A	1,2,3,4,5,6,7,8,9,10	A=05
Record = B	1,2,3,4,5,6,7,8,9,10	B=05
Internal Test = C	1,2,3,4,5,6,7,8,9,10	C = 05
Cumulative Internal Examination : A + B + C = 15	1,2,3,4,5,6,7,8,9,10	15
Semester End Examinations = D	1,2,3,4,5,6,7,8,9,10	D = 35
Total Marks: A + B + C + D = 50	1,2,3,4,5,6,7,8,9,10	50

ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	29-06-2026	22-08-2026	8 W
I Mid Examinations	24-08-2026	29-08-2026	1 W
II Phase of Instructions	31-08-2026	31-10-2026	8 W
II Mid Examinations	02-11-2026	07-11-2026	1 W
Preparation and Practical's	09-11-2026	14-11-2026	1 W
Semester End Examinations	16-11-2026	28-11-2026	2 W

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 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	Course Coordinator	Module Coordinator	HOD



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DEPARTMENT OF CIVIL ENGINEERING

PART-A

Name of Course Instructor: Dr K.V.Ramana/J. Eeshwar Ram

Course Name & Code : Strength of Materials Lab & 23CE53

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

Program/Sem : B. Tech / III-Sem

Regulation: R23

Credits : 1.5

A.Y. : 2026-27

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:

C01: Conduct tensile strength test and draw stress-strain diagrams for ductile metals (Apply)

C02: Perform bending test and determine load-deflection curve of steel/wood
(Apply)

C03: Able to conduct torsion test and determine torsion parameters (Apply)

C04: Perform hardness, impact and shear strength tests and calculate hardness numbers, impact and shear strengths (**Apply**)

C05: Able to conduct tests on closely coiled and open coiled springs and calculate deflections (**Apply**)

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

C0s	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011	P012	PS01	PS02	PS03
C01	2	2		2								1		1	1
C02	2	2		2								1		1	1
C03	2	2		2								1		1	1
C04	2	2		2								1		1	1
C05	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 ----- 25761A0101to 25761A0106	B ₁ ----- 25761A0135 to 25761A0141
A ₂ ----- 25761A0107 to 25761A0112	B ₂ ----- 25761A0142 to 25761A0147
A ₃ ----- 25761A0113 to 25761A0118	B ₃ -----25761A0148 to 25761A0154
A ₄ ----- 25761A0119 to 25761A0125	B ₄ -----25761A0155 to LE 4
A ₅ ----- 25761A0129 to 25761A0134	B ₅ -----LEs



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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
14-07-2026		Demo	Demo	Demo	Demo	Demo
21-07-2026		A ₁	A ₂	A ₃	A ₄	A ₅
28-07-2026		A ₅	A ₁	A ₂	A ₃	A ₄
04-08-2026		A ₄	A ₅	A ₁	A ₂	A ₃
11-08-2026		A ₃	A ₄	A ₅	A ₁	A ₂
18-08-2026		A ₂	A ₃	A ₄	A ₅	A ₁
25-08-2026		A ₁	A ₂	A ₃	A ₄	A ₅
01-09-2026		REPITATION LAB				

I CYCLE SCHEDULE: BATCH-B (Friday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
17-07-2026		Demo	Demo	Demo	Demo	Demo
24-07-2026		B ₁	B ₂	B ₃	B ₄	B ₅
31-07-2026		B ₅	B ₁	B ₂	B ₃	B ₄
07-08-2026		B ₄	B ₅	B ₁	B ₂	B ₃
14-08-2026		B ₃	B ₄	B ₅	B ₁	B ₂
21-08-2026		B ₂	B ₃	B ₄	B ₅	B ₁
28-08-2026		REPITATION LAB				



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DEPARTMENT OF CIVIL ENGINEERING

II CYCLE SCHEDULE: BATCH-A (Tuesday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
15-09-2026		A ₁	A ₂	A ₃	A ₄	A ₅
22-09-2026		A ₅	A ₁	A ₂	A ₃	A ₄
29-09-2026		A ₄	A ₅	A ₁	A ₂	A ₃
06-10-2026		A ₃	A ₄	A ₅	A ₁	A ₂
13-10-2026		A ₂	A ₃	A ₄	A ₅	A ₁
27-10-2026		REPITATION LAB				
03-11-2026		INTERNAL TEST				

II CYCLE SCHEDULE: BATCH-B (Friday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
11-09-2026		B ₁	B ₂	B ₃	B ₄	B ₅
18-09-2026		B ₅	B ₁	B ₂	B ₃	B ₄
25-09-2026		B ₄	B ₅	B ₁	B ₂	B ₃
09-10-2026		B ₃	B ₄	B ₅	B ₁	B ₂
16-10-2026		B ₂	B ₃	B ₄	B ₅	B ₁
30-10-2026		REPITATION LAB				
06-11-2026		REPITATION LAB				
10-11-2026		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: 25761A0101 to 25761A0134

Batch – B: 25761A0135 to LEs

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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DEPARTMENT OF CIVIL ENGINEERING

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.



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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

Dr K.V.Ramana

J. Eeshwar Ram

Module Coordinator

Dr. Ch. Rajamallu

HOD

Dr. K.V.Ramana



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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: B Rama Krishna/P Keerthi/M Karthik Kumar

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.: 2026-27

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	13-07-2026		TLM4	
2.	Sign conventions	1	18-07-2026		TLM2	
3.	Week1: Detailing & Drawing of Sign Conventions.	3	20-07-2026		TLM4	
4.	English bond	1	25-07-2026		TLM2	
5.	Week 2: Detailing & Drawing of English Bond.	3	27-07-2026		TLM4	
6.	Flemish bond	1	01-08-2026		TLM2	
7.	Week 3: Detailing & Drawing of Flemish Bond.	3	03-08-2026		TLM4	
8.	Introduction to doors and ventilators	1	08-08-2026		TLM2	
9.	Week 4: Detailing & Drawing of Doors.	3	10-08-2026		TLM4	
10.	Week 5: Detailing & Drawing of Windows.	3	17-08-2026		TLM4	
11.	Building Bye- Laws	1	22-08-2026		TLM2	
12.	Week 6: Detailing & Drawing of Ventilators & Roofs.	3	24-08-2026		TLM4	
13.	Building Bye- Laws	1	29-08-2026		TLM2	
14.	Week 7: Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws. Plan-1	3	31-08-2026		TLM4	
15.	Building Bye- Laws	1	05-09-2026		TLM2	
16.	Building Bye- Laws	1	19-09-2026		TLM2	
17.	Week 8: Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws. Plan-2	3	21-09-2026		TLM4	
18.	Building Bye- Laws	1	26-09-2026		TLM2	
19.	Week 9: Drawing of Plan, Elevation & Section for Hospital Building. Plan-3	3	28-09-2026		TLM4	
20.	Building Bye- Laws	1	03-10-2026		TLM2	
21.	Week 10: Drawing of Plan, Elevation & Section for Hospital Building. Plan-4	3	05-10-2026		TLM4	
22.	Building Bye- Laws	1	10-10-2026		TLM2	
23.	Week 11: Drawing of Plan, Elevation & Section for Industrial Building. Plan-5	3	12-10-2026		TLM4	
24.	Building Bye- Laws	1	17-10-2026		TLM2	
25.	Revision		26-10-2026 31-10-2026 02-11-2026 07-11-2026		TLM2 TLM4	
26.	LAB INTERNAL EXAM	3	09-11-2026			

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

PART-C

EVALUATION PROCESS (R23 Regulation):

Evaluation Task	Marks
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):

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

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