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

FRESHMAN ENGINEERING DEPARTMENT

COURSE HANDOUT
Part-A

PROGRAM : II B. Tech., I-Sem., CIVIL
ACADEMIC YEAR : 2024-25
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 : Dr. Y. P. C. S. Anil Kumar
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	15-07-2024		TLM1			
2.	Course Outcomes, Program Outcomes	1	18-07-2024		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	19-07-2024		TLM1	CO1	T1,T2	
4.	Bisection method, Secant method	1	22-07-2024		TLM1	CO1	T1,T2	
5.	Method of false position	1	24-07-2024		TLM1	CO1	T1,T2	
6.	Iteration method	1	25-07-2024		TLM1	CO1	T1,T2	
7.	Newton-Raphson method	1	26-07-2024		TLM1	CO1	T1,T2	
8.	Newton-Raphson method (simultaneous equations)	1	29-07-2024		TLM1	CO1	T1,T2	
9.	Newton's forward formulae for interpolation	1	31-07-2024		TLM1	CO1	T1,T2	
10.	Newton's forward formulae for interpolation	1	01-08-2024		TLM1	CO1	T1,T2	
11.	Newton's backward formulae for interpolation	1	02-08-2024		TLM1	CO1	T1,T2	
12.	Lagrange's interpolation formula	1	05-08-2024		TLM1	CO1	T1,T2	
13.	Lagrange's interpolation formula	1	07-08-2024		TLM1	CO1	T1,T2	
14.	TUTORIAL - I	1	08-08-2024		TLM3	CO1	T1,T2	
No. of classes required to complete UNIT-I	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

15.	Introduction to Unit – II	1	09-08-2024		TLM1	CO2	T1,T2	
16.	Trapezoidal Rule	1	12-08-2024		TLM1	CO2	T1,T2	
17.	Simpson's 1/3 Rule	1	14-08-2024		TLM1	CO2	T1,T2	
18.	Simpson's 3/8 Rule	1	16-08-2024		TLM1	CO2	T1,T2	
19.	Taylor Series Method	1	19-08-2024		TLM1	CO2	T1,T2	
20.	Picard's Method	1	21-08-2024		TLM1	CO2	T1,T2	
21.	Euler's Method	1	22-08-2024		TLM1	CO2	T1,T2	
22.	Runge Kutta Second order method	1	23-08-2024		TLM1	CO2	T1,T2	
23.	Runge Kutta Fourth order method	1	28-08-2024		TLM1	CO2	T1,T2	
24.	Milne's Predictor and Corrector method	1	29-08-2024		TLM1	CO2	T1,T2	
25.	TUTORIAL - II	1	30-08-2024		TLM3	CO2	T1,T2	
No. of classes required to complete UNIT-II		11			No. of classes taken:			

I MID EXAMINATIONS (02-09-2024 TO 07-09-2024)
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
26.	Introduction	1	09-09-2024		TLM1	CO3	T1,T2	
27.	Baye's theorem, problems	1	11-09-2024		TLM1	CO3	T1,T2	
28.	Random variables, Expectations	1	12-09-2024		TLM1	CO3	T1,T2	
29.	Problems on PMF	1	13-09-2024		TLM1	CO3	T1,T2	
30.	Problems on PDF	1	18-09-2024		TLM1	CO3	T1,T2	
31.	Binomial distribution	1	19-09-2024		TLM1	CO3	T1,T2	
32.	Poisson distribution	1	20-09-2024		TLM1	CO3	T1,T2	
33.	Uniform distribution	1	23-09-2024		TLM1	CO3	T1,T2	
34.	Normal distribution	1	25-09-2024		TLM1	CO3	T1,T2	
35.	TUTORIAL - III	1	26-09-2024		TLM3	CO3	T1,T2	
No. of classes required to complete UNIT-III		10			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
36.	Introduction	1	27-09-2024		TLM1	CO4	T1,T2	
37.	Sampling distribution, definitions	1	30-09-2024		TLM1	CO4	T1,T2	
38.	Sampling distribution of mean, variance	1	03-10-2024		TLM1	CO4	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
39.	Problems	1	04-10-2024		TLM1	CO4	T1,T2	
40.	Problems on central limit theorem	1	07-10-2024		TLM1	CO4	T1,T2	
41.	Estimation	1	09-10-2024		TLM1	CO4	T1,T2	
42.	Point and interval estimation	1	16-10-2024		TLM1	CO4	T1,T2	
43.	Estimation using t distribution	1	17-10-2024		TLM1	CO4	T1,T2	
44.	Estimation using χ^2 and F-distributions	1	18-10-2024		TLM1	CO4	T1,T2	
45.	Tutorial-4	1	21-10-2024		TLM3	CO4	T1,T2	
No. of classes required to complete UNIT-IV		10			No. of classes taken:			

UNIT-V: Vector Integration

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
46.	Testing of Hypothesis definitions	1	23-10-2024		TLM1	CO5	T1,T2	
47.	Z-test for means	1	24-10-2024		TLM1	CO5	T1,T2	
48.	Z-test for means	1	25-10-2024		TLM1	CO5	T1,T2	
49.	Z-test for proportions	1	28-10-2024		TLM1	CO5	T1,T2	
50.	Z-test for proportions	1	30-10-2024		TLM1	CO5	T1,T2	
51.	t-test for means	1	01-11-2024		TLM1	CO5	T1,T2	
52.	F-test for variances	1	04-11-2024		TLM1	CO5	T1,T2	
53.	χ^2-test for goodness of fit	1	06-11-2024		TLM1	CO5	T1,T2	
54.	χ^2-test for independence of attributes	1	07-11-2024		TLM1	CO5	T1,T2	
55.	Tutorial-5	1	08-11-2024		TLM1	CO5	T1,T2	
No. of classes required to complete UNIT-V		10			No. of classes taken:			

Content beyond the Syllabus

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
56.	Gauss interpolation formula	1	07-08-2024		TLM2	CO1	T1,T2	
No. of classes		1			No. of classes taken:			
II MID EXAMINATIONS (11-11-2024 TO 16-11-2024)								

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

PART-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

K. N. V. Lakshmi	Dr. Y. P. C. S. Anil Kumar	Dr. A. RAMI REDDY	Dr. A. RAMI REDDY
Course Instructor	Course Coordinator	Module Coordinator	HOD

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor: EESHWAR RAM J
Course Name : UHV- II: Understanding Harmony and Ethical Human Conduct
Course Code : 23HS01 **Credits:** 3 **L-T-P Structure:** 3-0-0
Program/Sem/Sec : B.Tech/III Semester – Civil **A.Y.** : 2024-25

PREREQUISITE: Nil

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

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

CO1: Describe the terms like Natural Acceptance, Happiness and Prosperity (L2)
CO2: Identify one's self, and one's surroundings (family, society nature) (L2)
CO3: Relate human values with human relationship and human society. (L2)
CO4: Illustrate the need for universal human values and harmonious existence (L2)
CO5: Develop as socially and ecologically responsible engineers (L3)

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

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

TEXTBOOKS:

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

REFERENCE BOOKS:

R1 Jeevan vidya: Ek Parichaya, A.Nagaraj, Jeevan Vidya Prakashan, Amarkantak,1999
R2 Human values, A N Tripathi, New Age Publishers, New Delhi, 2004
R3 The story of my experiments with Truth, Mohandas Karamchand Gandhi

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Introduction to Value Education

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, COs	1	15-07-2024		TLM2	
2.	Process for self exploration: Natural Acceptance	1	19-07-2024		TLM.2	
3.	Right Understanding, Relationship and Physical Facility	2	20-07-2024 22-07-2024		TLM2	
4.	Understanding Value Education	1	24-07-2024		TLM2	
5.	self-exploration as the Process for Value Education	1	26-07-2024		TLM2	
6.	Continuous Happiness and Prosperity	2	27-07-2024 29-07-2024		TLM2	
7.	Happiness and Prosperity	1	31-07-2024		TLM2	
8.	Method to Fulfill the Basic Human Aspirations	1	02-08-2024		TLM2	
9.	Tutorial	1	03-08-2024		TLM2	
No. of classes required to complete UNIT-I: 11				**No. of classes taken:**		

UNIT-II: Harmony in the Human Being

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
10.	Understanding Human being as the Co-existence of the self and the body	1	05-08-2024	1-08-24	TLM2	
11.	Distinguishing between the Needs of the self and the body	2	07-08-2024 09-08-2024	02-08-24	TLM2	
12.	The body as an Instrument of the self	1	10-08-2024	03-8-24	TLM2	
13.	Understanding Harmony in the self	2	12-08-2024 14-08-2024	6-08-24	TLM2	
14.	Harmony of the self with the body	1	16-08-2024	08-08-24	TLM2	
15.	Programme to ensure self-regulation and Health	1	17-08-2024	09-8-24	TLM2	
16.	Tutorial - 1	1	19-08-2024	13-8-24	TLM2	
17.	Tutorial -2	1	21-08-2024	16-8-24	TLM1	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT III: Harmony in the Family and Society

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
18.	Harmony in the Family	2	23-08-2024 24-08-2024		TLM2	
19.	'Trust' – the Foundational Value in Relationship	1	28-08-2024		TLM2	
20.	Practice Session PS7 Exploring the Feeling of Trust	1	30-08-2024		TLM2	
21.	'Respect' – as the Right Evaluation	1	31-08-2024		TLM1	
22.	Practice Session PS8 Exploring the Feeling of Respect	2	09-09-2024 11-09-2024		TLM2	
23.	Other Feelings, Justice in Human-to-Human Relationship	1	13-09-2024		TLM2	
24.	Understanding Harmony in the Society	2	14-09-2024 18-09-2024		TLM2	
25.	Vision for the Universal Human Order	1	20-09-2024		TLM2	
No. of classes required to complete UNIT-III: 11				**No. of classes taken:**		

UNIT-IV: Harmony in the Nature/Existence

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	Understanding Harmony in the Nature	2	21-09-2024		TLM2	
27.	Interconnectedness, self-regulation	1	23-09-2024		TLM2	
28.	Mutual Fulfilment among the Four Orders of Nature	1	25-09-2024		TLM2	
29.	Realizing Existence as Co-existence at All Levels	2	27-09-2024 28-09-2024		TLM2	
30.	The Holistic Perception of Harmony in Existence	2	30-09-2024 04-10-2024		TLM2	
31.	Tutorial -1	2	05-10-2024		TLM2	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: Implications of the Holistic Understanding

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
32.	Natural acceptance of human values	1	14-10-2024		TLM2	
33.	Definitiveness of ethical human conduct	1	16-10-2024		TLM2	
34.	Basis for humanistic education	1	18-10-2024		TLM2	
35.	A Basis for Humanistic Education, Humanistic	2	19-10-2024 21-10-2024		TLM2	

36.	Constitution and Universal Human Competence in professional ethics	1	23-10-2024		TLM2	
37.	Strategy for transition from the present state to universal human order	1	25-10-2024		TLM2	
38.	Holistic Technologies, Production Systems and Management Models-Typical Case	1	26-10-2024		TLM2	
No. of classes required to complete UNIT-V: 8				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

ACADEMIC CALENDAR: A.Y 2024-25

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

Signature				
Name of the Faculty	**Eeshwar Ram J**	**Dr. B. SRINIVASA RAO**	**Eeshwar Ram J**	**Dr. J Venktateswara RAO**
Title	**Course Instructor**	**Course Coordinator**	**Module Coordinator**	**Head of the Department**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr C.RAJAMALLU
Course Name & Code : SURVEYING & 23CE01   **Regulation**: R23
L-T-P Structure :03-0-0   **Credits:** 03
Program/Sem/Sec : B.Tech/III Sem/A   **A.Y.:** 2024-25

PREREQUISITE:
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 equipments 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	Statement	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	Apply
CO 3	Apply surveying principles to determine areas and volumes	Apply
CO 4	Setting out curves and using modern surveying equipments	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	15-07-2024			
2.	Introduction to Unit-I	1	16-07-2024			
3.	Objectives, Classification and principles of surveying	1	18-07-2024			
4.	Surveying accessories	1	22-07-2024			
5.	Compass- Survey-Introduction	1	23-07-2024			
6.	leveling	1	24-07-2024			
7.	Plane table surveying	1	25-07-2024			
8.	Linear distances- Approximate methods, Direct Methods- Chains-Tapes, ranging, Tape corrections	1	29-07-2024			
9.	Prismatic Compass- Bearings, included angles, W.C.B and Q.B systems of locating bearings.	1	30-07-2024			
10.	Local Attraction, Magnetic Declination, and dip –systems	1	31-07-2024			
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	01-08-2024			
2.	Determination of levels,.	1	05-08-2024			
3	TUTORIAL-1		05-08-2024			
4.	Effect of Curvature of Earth and Refraction	1	06-08-2024			
5.	Contouring- Characteristics	1	07-08-2024			
6.	uses of Contours, methods of contour surveying.	1	08-08-2024			
7.	Areas - Determination of areas consisting of irregular boundary and regular boundaries	1	12-08-2024			
8.	TUTORIAL-2	1	12-08-2024			
9.	Volumes -Determination of volume of earth work in cutting and embankments for level section, capacity of reservoirs.	1	13-08-2024			
10.	TUTORIAL-3	1	13-08-2024			
No. of classes required to complete UNIT-II:10				**No. of classes taken:10**		

UNIT-III: THEODOLITE SURVEYING AND TRAVERSING

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Theodolite Surveying: Types of Theodolites, temporary adjustments,	1	14-08-2024			
2.	measurement of horizontal angle by repetition method and reiteration method,	1	20-08-2024			
3.	measurement of vertical Angle,	1	21-08-2024			
4.	Trigonometrical leveling when base is accessible and inaccessible.	1	22-08-2024			
5.	TUTORIAL-1	1	22-08-2024			
6.	Traversing: Methods of traversing, traverse computations and adjustments,	1	26-08-2024			
7	TUTORIAL-2		26-08-2024			
8.	Introduction to Omitted measurements.	1	27-08-2024			
9.	Problems	1	28-08-2024			
10.	Problems	1	29-08-2024			
	MID-I		02-09-2024	07-09-2024		
No. of classes required to complete UNIT-III:10				**No. of classes taken:**		

UNIT-IV: : CURVES AND MODERN SURVEYING METHODS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Curves: Types of curves and their necessity	1	09-09-2024			
2.	elements of simple curves	1	10-09-2024			
3.	elements of compound	1	11-09-2024			
4.	elements of reverse curves	1	12-09-2024			
5.	Problems	1	17-09-2024			
6.	Introduction to Tachometric Surveying.	1	18-09-2024			
7.	Problems	1	19-09-2024			
8.	Tutorial-I	1	23-09-2024			
9.	Introduction-Modern Surveying Methods:	1	24-09-2024			
10.	Total station- advantages .	1	25-09-2024			
11.	Total station- Applications.	1	26-09-2024			
12.	Introduction to Global Positioning System.	1	03-10-2024			
13.	Introduction to Drone survey	1	14-10-2024			
14.	Introduction to LiDAR Survey (Light Detection And Ranging).	1	15-10-2024			
No. of classes required to complete UNIT-IV:14				**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,	1	16-10-2024			
2.	Basic concepts,	1	21-10-2024			
3.	perspective geometry of aerial photograph,		22-10-2024			
4.	relief and tilt displacements,	1	23-10-2024			
5.	terrestrial photogrammetry,	1	24-10-2024			
6	flight planning;		28-10-2024			
7.	Stereoscopy, ground control extension for photographic mapping-		29-10-2024			
8.	aerial triangulation, radial triangulation, methods;.	1	30-10-2024			
9.	photographic mapping-	1	04-11-2024			
10	mapping using paper prints,		05-11-2024			
11	mapping using stereo-	1	06-11-2024			
12	plotting instruments, mosaics, map substitutes	1	07-11-2024			
No. of classes required to complete UNIT-V: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 (R23 Regulation):

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

PART-D
PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineeringproblems.
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 researchmethods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activitieswith 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 theDepartment
Name of the Faculty	Dr C.Rajamallu	Dr C.Rajamallu	Dr C.Rajamallu	Dr.J venkateswara Rao
Signature				

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

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

Name of Course Instructor   : Dr.J.Venkateswara Rao
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 : 2024-25
PRE-REQUISITE   : Applied Mechanics

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

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

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

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

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

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

TEXTBOOKS:

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

REFERENCES:

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

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

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

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: SIMPLE STRESSES AND STRAINS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Interaction	1	16-07-2024		1	
2.	Introduction to Strength of Materials	1	18-07-2024		1	
3.	Mechanical Properties of Materials	1	2007-2024		1	
4.	Types of stresses and strains	1	23-07-2024		1	
5.	Stress strain diagram and Hooks law	1	24-07-2024		1,2	
6.	Problems on Stress strain Relationship	1	25-07-2024		1	
7.	Analysis of Varying bars	1	27-07-2024		1	
8.	Problems on Compound bars	1	30-07-2024		1	
9.	Relation between Elastic constants	1	31-07-2024		1	
10.	Stresses in Composite bars	1	01-08-2024		1	
11.	Stresses in Composite bars	1	03-08-2024		1,6	
No. of classes required to complete UNIT-I: 10				**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	06-08-2024		1,2	
2.	Reactions in SS beam with elementary loads	1	08-08-2024		1	
3.	Reactions in SS beam with elementary loads	1	10-08-2024		1	
4.	Reactions in cantilever beam with elementary loads	1	13-08-2024		1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
5.	SFD and BMD in Cantilever beam with UDL and point load	1	14-08-2024		1	
6.	SFD and BMD in Cantilever beam with Partial UDL and varying loads	1	17-08-2024		1	
7.	SFD and BMD in SS beam with UDL and point load	1	20-08-2024		1	
8.	SFD and BMD in SS beam with Partial UDL and varying loads	1	21-082024		1	
9.	SFD and BMD of Cantilever beam with combined loading	1	22-08-2024		1,2	
10.	SFD and BMD of Cantilever beam with combined loading	1	24-08-2024		1,2	
11.	SFD and BMD of SS beam with combined loading	1	27-08-2024		1	
12.	SFD and BMD of SS beam with combined loading	1	28-08-2024		1,6	
13.	Relation B/W shear force loading and BMD- Loading	1	30-08-2024		1	
No. of classes required to complete UNIT-III: 12				**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	31-08-2024		1,2	
2.	I MID Examinations	1	03-09-2024		1	
3.	I MID Examinations	1	04-09-2024		1	
4.	I MID Examinations	1	05-09-2024		1	
5.	Finding bending stress in rectangular section	1	10-09-2024		1	
6.	Finding bending stress in I,T section	1	11-09-2024		1	
7.	Design of simple beam for bending	1	12-09-2024		1	
8.	Horizontal shear stress derivation	1	14-09-2024		1,2	
9.	Horizontal shear stress in Rec. sec	1	17-09-2024		1,2	
10.	Horizontal shear stress in Circular and Triangular sec	1	18-09-2024		1,2	
11.	Horizontal shear stress in I section	1	19-09-2024		1,2	
12.	Torsion formula Derivation	1	21-09-2024		1	
13.	Problems on finding shear stress in shafts	1	24-09-2024		1	
14.	Problems on finding power transmitted in shafts	1	25-09-2024		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	26-09-2024		1,2	
2.	Double integration method application to Cantilever beam loadings	1	28-09-2024		1	
3.	Double integration method application to Cantilever beam loadings	1	30-09-2024		1	
4.	Double integration method application to simply supported beam loadings	1	31-09-2024		1	
5.	Macaulay's method application to simply supported beam loadings	1	01-10-2024		1	
6.	Macaulay's method application to simply supported beam loadings	1	02-10-2024		1	
7.	Moment area method application to find deflections in cantilevers	1	04-10-2024		1	
8.	Moment area method application to find deflections in SS beam	1	05-10-2024		1	
9.	Moment area method application to find deflections in SS beam	1	15-10-2024		1,6	
10.	Review on Unit-4	1	16-10-2024		1,6	
No. of classes required to complete UNIT-II: 10				**No. of classes taken:**		

UNIT-V: COLUMNS- THIN AND THICK CYLINDERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Terminology in columns and Euler's long column	1	17-10-2024		1,2	
2.	Critical load for both ends hinged and fixed support conditions of columns	1	19-10-2024		1,2	
3.	Critical load for one end hinged/free and other end fixed	1	22-10-2024		1,2	
4.	Slenderness ratio and Limitation of Euler's theorem	1	23-10-2024		1,2	
5.	Rankine – Gordon formula and application	1	24-10-2024		1,2	
6.	Eccentric loading and Secant formula	1	26-10-2024		1,2	
7.	Longitudinal and circumferential stresses	1	29-10-2024		1	
8.	Hoop, longitudinal and volumetric strains	1	30-10-2024		1	

9.	Changes in volume of cylinder	1	02-11-2024		1,6	
10.	Lames theory for thick	1	05-11-2024		1	
11.	Stresses in thick cylinders	1	06-11-2024		1	
12.	Compound cylinders	1	07-11-2024		1	
13.	Compound cylinders	1	09-11-2024		1,6	
14.	II MID Examinations		12-11-2024			
15.	II MID Examinations		13-11-2024			
16.	II MID Examinations		14-11-2024			
17.	II MID Examinations		16-11-2024			

No. of classes required to complete UNIT-IV: 13	**No. of classes taken:**

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

PART-C

EVALUATION PROCESS (R20Regulations):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

	for sustainable development.
PO 8	**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. J.Venkateswara Rao	Dr. J.Venkateswara Rao	Dr.C.Rajamallu	Dr. J.V. Rao
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)
L.B. Reddy Nagar, Mylavaram-521 230. Andhra Pradesh, INDIA
Affiliated to JNTUK, Kakinada & Approved by AICTE New Delhi
NAAC Accredited with "B++" grade, New Delhi & Certified by ISO 9001:2015,
DEPARTMENT OF CIVIL ENGINEERING
http://www.lbrce.ac.in, hodcivil@lbrce.ac.in Ph: 08659-222933, Fax: 08659-222931

COURSE HANDOUT

PART-A

Program	: **B.Tech, III Sem, Civil, A**
Academic Year	: **2024-25**
Course Name & Code	: **Fluid Mechanics** & 23CE03
L-T-P- Cr	: 3-0-0-**3**
Course Instructor	: Dr. V. Ramakrishna

Pre-Requisite : 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 in measuring quantities of fluid flowing in pipes, tanks and channels.
4	To teach integral forms of fundamental laws of fluid mechanics to predict relevant pressures, velocities and forces.
5	To strengthen the students with fundamentals useful in application-intensive courses dealing with hydraulics, hydraulic machinery and hydrology in future courses.

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

CO1	Understand the fluid properties, principles of fluid statics, and buoyancy	L2
CO2	Apply the laws of fluid statics and buoyancy	L3
CO3	Understand the fundamentals of fluid kinematics, dynamics, differentiate types of fluid flows and loss in pipes	L2
CO4	Derive and apply the principle of conservation of mass, energy, and momentum for flow measurement	L3
CO5	Compute the losses in pipes and discharge through pipe flows	L3

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

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

Text Books (T) and Reference Books (R):

T1 R. K. Bansal, A text of Fluid mechanics and hydraulic machines, Laxmi Publications (P) Ltd., New Delhi 11th Edition, 2024.

T2 P. N. Modi and S. M. Seth, Hydraulics and Fluid Mechanics, Standard Book House 22nd Edition, 2019.

R1 K. Subrahmanya, Theory and Applications of Fluid Mechanics, Tata McGraw Hill, 2nd Edition 2018

R2 C. S. P. Ojha, R. Berndtsson and P. N. Chadramouli, Fluid Mechanics and Machinery, Oxford University Press, 2010.

R3 N. Narayana Pillai, Principles of Fluid Mechanics and Fluid Machines, Universities Press Pvt Ltd, Hyderabad. 3rd Edition 2009.

R4 Frank M. White, Henry Xue, Fluid Mechanics, Tata McGraw Hill, 9th Edition, 2022.

R5 S K Som, Gautam Biswas, S Chakraborty, Introduction to Fluid Mechanics & Fluid Machines, 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: Properties of Fluids and Fluid Statics

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction	1	16.7.24		1	
2.	Basic Properties	1	20.7.24		1	
3.	Viscosity	1	21.7.24		1	
4.	Problems	1	23.7.24		4	
5.	Types of fluids, Surface Tension	1	24.7.24		1	
6.	Capillarity	1	26.7.24		1	
7.	Compressibility and Bulk Modulus	1	27.2.24		1	
8.	Fluid Pressure Basics	1	30.7.24		1	
9.	Pascal law	1	31.7.24		1	
10.	Peizometer and manometer	1	2.8.24		1	
11.	Differential manometer	1	3.8.24		1	
12.	Pressure gages	1	6.8.24		1	
13.	Problems	1	7.8.24		4	
14.	Problems	1	9.8.24		4	
No. of classes required to complete UNIT-I: 14				Actual classes taken:		

UNIT-II: Hydrostatic Forces and Buoyancy

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
15.	HSF on Vertical and Horizontal	1	10.8.24		1	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
	planes					
16.	Problems	1	13.8.24		4	
17.	Problems	1	14.8.24		4	
18.	HSF on Inclined planes	1	16.8.24		1	
19.	Problems	1	17.8.24		4	
20.	Buoyancy and Metacenter	**1**	20.8.24		1	
21.	Problems	1	21.8.24		4	
22.	Equilibrium for floating bodies	1	23.8.24		1	
23.	Problems	**1**	24.8.24		4	
24.	Equilibrium for submerged bodies	1	27.8.24		1	
25.	Problems	1	28.8.24		4	
No. of classes required to complete UNIT-II: 11				Actual classes taken:		

Mid-1: 2.9.24 to 7.9.24

UNIT-III: Fluid Kinematics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
26.	Types of fluid flows	1	30.8.24		1	
27.	Types of fluid flows	1	31.8.24		1	
28.	Types of fluid flows	1	10.9.24		1	
29.	Types of fluid flows	1	11.9.24		1	
30.	Velocity potential and stream function	1	13.9.24		1	
31.	Problems	1	14.9.24		4	
32.	Continuity equation for 1D flow	1	17.9.24		1	
33.	Problems	1	18.9.24		4	
34.	Continuity equation for 3D flow	1	20.9.24		1	
35.	Problems	1	21.9.24		4	
No. of classes required to complete UNIT-III: 10				Actual classes taken:		

UNIT-IV: Fluid Dynamics

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Types of Forces, Euler's equation	1	24.9.24		1	
37.	Bernoulli equation	1	25.9.24		1	
38.	Problems	1	27.9.24		4	
39.	Venturimeter	1	28.9.24		1	
40.	Orificemeter	1	1.10.24		1	
41.	Pitot Tube	1	4.10.24		1	
42.	Problems	1	5.10.24		4	
43.	Forces exerted on pipe bend	1	8.10.24		1	
44.	Problems	1	9.10.24		4	

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
45.	Problems	1	16.10.24		4	
46.	Free Vortex flow	1	18.10.24		1	
47.	Problems	1	19.10.24		4	
48.	Forced Vortex flow	1	22.10.24		1	
49.	Problems	1	23.10.24		4	
No. of classes required to complete UNIT-IV:				Actual Classes taken:		

UNIT-V: Head losses in Pipe flows

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
50.	Energy losses in pipelines	1	25.10.24		1	
51.	Darcy – Weisbach equation	1	26.10.24		1	
52.	Problems	1	29.10.24		4	
53.	Pipes in series and parallel	**1**	30.10.24		1	
54.	Problems	1	1.11.24		4	
55.	Problems	1	2.11.24		4	
56.	Problems	1	5.11.24		4	
57.	HGL and TEL	1	6.11.24		1	
58.	Problems	1	8.11.24		4	
59.	Dimensionless Numbers	1	9.11.24		1	
No. of classes required to complete UNIT-V: 10				Actual Classes taken:		

Mid-2: 11.11.24 to 16.11.24

Teaching Learning Methods

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

Program Educational Objectives (PEOs)

PEO1	To possess knowledge in both fundamental and application aspects of mathematical, scientific, engineering principles to analyze complex engineering problems for meeting the national and international requirements and demonstrating the need for sustainable development
PEO2	To adapt to the modern engineering tools for planning, analysis, design, implementation of analytical data and assess their relevant significance in societal and legal issues necessary in their professional career
PEO3	To exhibit professionalism, ethical attitude, communication, managerial skills, team work and social responsibility in their profession and adapt to current trends by engaging in continuous learning

Program Outcomes (POs)

PO1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems
PO2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences
PO3	**Design/development of solutions**: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations
PO4	**Conduct investigations of complex problems**: Use research-based knowledge and research methods

	including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions
PO5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development
PO8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice
PO9	**Individual and team work**: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings
PO10	**Communication**: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions
PO11	**Project management and finance**: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments
PO12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change

Program Specific Outcomes

PSO1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering
PSO2	Possesses ability to plan, examine and analyze the various laboratory tests required for the professional demands
PSO3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Title	Course Instructor	Course Coordinator	Module Coordinator	HOD
Faculty Name	Dr V. Ramakrishna	Dr V. Ramakrishna	J. Rangaiah	Dr J.V. Rao
Signature				

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., CE
ACADEMIC YEAR   : 2024-25
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	-	-	-

Correlation Levels: **1**-Slight (Low), **2**-Moderate (Medium), **3**-Substantial (High) and No correlation: **'-'**

Textbooks (T) and References (R):

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.

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

R2. Deeksha Dave and E.Sai Baba Reddy, Textbook of Environmental Science, 2/e, Cengage Publications, 2012.

R3. M.Anji Reddy, "Textbook of Environmental Sciences and Technology", BS 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	16-07-2024		TLM2			
2.	Multidisciplinary Nature of Environmental Studies	1	19-07-2024		TLM2			

UNIT-I: Multidisciplinary nature of Environmental Science

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	20-07-2024		TLM1	CO1	T1,T2	
4.	Water resources	1	23-07-2024		TLM1	CO1	T1,T2	
5.	Mineral resources	1	27-07-2024		TLM1	CO1	T1,T2	
6.	Food resources	1	30-07-2024		TLM1	CO1	T1,T2	
7.	Energy resources	1	03-08-2024		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-I	07					No. of classes taken:		

UNIT-II: Ecosystems & 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	06-08-2024		TLM1	CO1	T1,T2	
9.	Ecological succession & Food chains, Food webs & Ecological Pyramids	1	10-08-2024		TLM1	CO1	T1,T2	
10.	Types of ecosystems	1	13-08-2024		TLM1	CO1	T1,T2	
11.	Biodiversity – introduction, levels, biogeographic classification	1	17-08-2024		TLM1	CO1	T1,T2	

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
12.	Values of Biodiversity, India as mega diversity nation	1	20-08-2024		TLM1	CO1	T1,T2	
13.	Threats to biodiversity	1	24-08-2024		TLM1	CO1	T1,T2	
14.	Conservation of biodiversity	1	27-08-2024		TLM1	CO1	T1,T2	
No. of classes required to complete UNIT-II		07			No. of classes taken:			

I MID EXAMINATIONS (02-09-2024 TO 09-09-2024)

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
15.	Environmental pollution -Air pollution	1	10-09-2024		TLM1	CO2	T1,T2	
16.	Water pollution, Marine pollution, Thermal pollution	1	13-09-2024		TLM1	CO2	T1,T2	
17.	Soil pollution	1	17-09-2024		TLM1	CO2	T1,T2	
18.	Noise pollution & Nuclear Hazards	1	20-09-2024		TLM1	CO2	T1,T2	
19.	Solid waste management	1	24-09-2024		TLM1	CO2	T1,T2	
20.	Disaster management	1	27-09-2024		TLM1	CO2	T1,T2	
No. of classes required to complete UNIT-III		06			No. of classes taken:			

UNIT-IV: Social issues and environment

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
21.	From Unsustainable to Sustainable development	1	01-09-2024		TLM1	CO3	T1,T2	
22.	Urban problems related to energy – Resettlement and rehabilitation of people; its problems and concerns	1	04-10-2024		TLM1	CO3	T1,T2	
23.	Environmental ethics, Climate change	1	08-10-2024		TLM1	CO3	T1,T2	
24.	Carbon credits & Mission LiFE - Wasteland reclamation. – Consumerism and waste products	1	15-10-2024		TLM1	CO3	T1,T2	
25.	Environmental Acts	1	18-10-2024		TLM1	CO3	T1,T2	
26.	Environmental Acts	1	22-10-2024		TLM1	CO3	T1,T2	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

UNIT-V: Human population and environment

S.	Topics to be covered	No. of	Tentative	Actual	Teaching	Learning	Text	HOD

No.		Classes Required	Date of Completion	Date of Completion	Learning Methods	Outcome COs	Book followed	Sign Weekly
27.	Population growth, variation among nations. Population explosion – Family Welfare Programmes.	1	25-10-2024		TLM1	CO4	T1,T2	
28.	Environment and human health –Human Rights – Value Education	1	29-10-2024		TLM1	CO4	T1,T2	
29.	HIV/AIDS – Women and Child Welfare	1	01-11-2024		TLM1	CO4	T1,T2	
30.	Role of information Technology in Environment and human health	1	05-11-2024		TLM1	CO4	T1,T2	
31.	Case studies	1	08-11-2024		TLM1	CO4	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
32.	Case studies	2	24-09-2024 05-11-2024		TLM2	CO2	T1,T2	
No. of classes		2			No. of classes taken:			

II MID EXAMINATIONS (11-11-2024 TO 16-11-2024)

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

PART-C EVALUATION PROCESS (R23 Regulation):

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

PART-D PROGRAMME OUTCOMES (POs):

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

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

Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	**Dr. Shaheda Niloufer**	**Dr. A. RAMI REDDY**
Course Instructor	Course Coordinator	Module Coordinator	HOD

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

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT
PART-A

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

PREREQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs):

By the end of this course student will be able to

1. Know about various linear and angular measuring instruments

2. Take Measurements in the linear and angular view

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

4. Know modern equipment such as total station

5. Draft field notes from survey data

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

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

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

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

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

S. No.	Topics to be covered (Experiment Name)	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Chain survey of road profile with offsets in case of road widening.	3	15-07-2024 18-07-2024			
2.	Determination of distance between two inaccessible points by using compass.	3	22-07-2024 25-07-2024			
3.	Plane table survey ;finding the area of a given boundary by the method of Radiation	3	29-07-2024 01-08-2024			
4.	Fly levelling : Height of the instrument method (differential leveling)	3	05-08-2024			
5.	Fly levelling: rise and fall method.	3	08-08-2024			
6.	Theodolite survey: determining the horizontal and vertical angles by the method ofrepetition method	3	12-08-2024 22-08-2024			
7.	Theodolite survey: finding the distance between two in accessible points.	3	29-08-2024 09-09-2024			
8.	Theodolite survey: finding the height of far object	3	12-09-2024 19-09-2024			
9.	Determination of distance between two inaccessible point by usin total station	3	23-09-2024 26-09-2024			
10.	Determination of area perimeter using total station	3	30-09-2024 03-10-2024			
11.	Setting out a curve	3	14-10-2024 21-10-2024			
12	Determining the levels of contours	3	24-10-2024 28-10-20214			
No. of classes required to complete:24				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R23 Regulation):

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

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

	Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty		Dr C.Rajamallu	Dr C.Rajamallu	Dr C.Rajamallu	Dr.J.venkateswara rao
Signature					

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: Dr. J. Venkateswara Rao, Mr. P. Mohanaganga Raju, J. Eeshwar Ram

Course Name & Code	: Strength of Materials Lab & 23CE53	**Regulation:** R23	
L-T-P Structure	: 0-0-3	**Credits**	: 1.5
Program/Sem	: B. Tech / III-Sem	**A.Y.**	: 2024-25

Pre-requisites: NIL

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

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

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

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

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

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

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

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

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

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

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

DEPARTMENT OF CIVIL ENGINEERING

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 (Monday)	BATCH: B (Thursday)
A_1 -----23761A0101to 22761A0106	B_1 ----23761A01030 to 23761A0135
A_2 -----23761A0107 to 23761A0112	B_2-----23761A01036 to 23761A0142
A_3 ---- 23761A0113 to 23761A0118	B_3 ---- LE 1 to LE 6
A_4 ----- 23761A0119 to 23761A0124	B_4 ---- LE 7 to LE 12
A_5 ----- 23761A0125 to 23761A0129	B_5 ---- LE l3 to LE 17

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

I CYCLE SCHEDULE: BATCH-A (Monday)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
15-07-2024		Demo	Demo	Demo	Demo	Demo
22-07-2024		A_1	A_2	A_3	A_4	A_5
29-07-2024		A_5	A_1	A_2	A_3	A_4
05-08-2024		A_4	A_5	A_1	A_2	A_3
12-08-2024		A_3	A_4	A_5	A_1	A_2
19-08-2024		A_2	A_3	A_4	A_5	A_1

I CYCLE SCHEDULE: BATCH-B (THURSDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
18-07-2024		Demo	Demo	Demo	Demo	Demo
25-07-2024		B_1	B_2	B_3	B_4	B_5
01-08-2024		B_5	B_1	B_2	B_3	B_4
08-08-2024		B_4	B_5	B_1	B_2	B_3
22-08-2024		B_3	B_4	B_5	B_1	B_2
29-08-2024		B_2	B_3	B_4	B_5	B_1

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

DEPARTMENT OF CIVIL ENGINEERING

II CYCLE SCHEDULE: BATCH-A (MONDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
09-09-2024		A_1	A_2	A_3	A_4	A_5
23-09-2024		A_5	A_1	A_2	A_3	A_4
30-09-2024		A_4	A_5	A_1	A_2	A_3
07-10-2024		A_3	A_4	A_5	A_1	A_2
14-10-2024		A_2	A_3	A_4	A_5	A_1
21-10-2024		*REPITATION LAB*				
28-10-2024		*REPITATION LAB*				
04-11-2024		*INTERNAL TEST*				

II CYCLE SCHEDULE: BATCH-B (THURSDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V
12-09-2024		B_1	B_2	B_3	B_4	B_5
19-09-2024		B_5	B_1	B_2	B_3	B_4
26-09-2024		B_4	B_5	B_1	B_2	B_3
03-10-2024		B_3	B_4	B_5	B_1	B_2
10-10-2024		B_2	B_3	B_4	B_5	B_1
17-10-2024		*REPITATION LAB*				
24-10-2024		*REPITATION LAB*				
07-11-2024		*INTERNAL TEST*				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

LAB TIMETABLE

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

Batch – A: 23761A0101 to 23761A0129

Batch – B: 22761A0130 to LE-17

ACADEMIC CALENDAR

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

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**

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineeringfundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complexengineering 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 anddesign system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**: Use research-based knowledge and researchmethods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**: Create, select, and apply appropriate techniques, resources, and modernengineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**: Apply reasoning informed by the contextual knowledge to assesssocietal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutionsin societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms ofthe engineering practice.
PO 9	**Individual and team work**: Function effectively as an individual, and as a member or leader indiverse teams, and in multidisciplinary settings.
PO 10	**Communication**: Communicate effectively on complex engineering activities with the engineeringcommunity 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 theengineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage inindependent and life-long learning in the broadest context of technological change.

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

DEPARTMENT OF CIVIL ENGINEERING

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor	**Module Coordinator**	**HOD**
Dr. J. Venkateswara Rao		
Mr. P. Mohanaganga Raju	Dr. Ch. Rajamallu	Dr. J. Venkateswara Rao
Mr. J. Eeshwar Ram		

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: B Rama Krishna/B.Narasimharao/Dr K V Ramana
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.:** 2024-25

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 Sign conventions	1	16-07-2024		TLM2	
2.	Week1: Detailing & Drawing of Sign Conventions.	3	20-07-2024		TLM4	
3.	English bond	1	23-072024		TLM2	
4.	Week 2: Detailing & Drawing of English Bond.	3	27-07-2024		TLM4	
5.	Flemish bond	1	30-07-2024		TLM2	
6.	Week 3: Detailing & Drawing of Flemish Bond.	3	03-08-2024		TLM4	
7.	Introduction to doors	1	06-08-2024		TLM2	
8.	Introduction to windows	1	13-08-2024		TLM2	
9.	Week 4: Detailing & Drawing of Doors.	3	17-08-2024		TLM4	
10.	Ventilators & Roofs	1	20-08-2024		TLM2	
11.	Week 5: Detailing & Drawing of Windows.	3	24-08-2024		TLM4	
12.	Building Bye- Laws	1	27-08-2024		TLM2	
13.	Week 6: Detailing & Drawing of Ventilators & Roofs.	3	31-08-2024		TLM4	
14.	Revision	1	10-09-2024		TLM2	
15.	Building Bye- Laws	1	17-09-2024		TLM2	
16.	Week 7: Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws. **Plan-1**	3	21-09-2024		TLM4	
17.	Building Bye- Laws	1	24-09-2024		TLM2	
18.	Week 8: Drawing of Line Diagram of Residential Buildings by using Building Bye- Laws. **Plan-2**	3	28-09-2024		TLM4	
19.	Building Bye- Laws	1	01-10-2024		TLM2	
20.	Week 9: Drawing of Plan, Elevation & Section for Hospital Building. **Plan-3**	3	05-10-2024		TLM4	
21.	Building Bye- Laws	1	08-10-2024		TLM2	
22.	Building Bye- Laws	1	15-10-2024		TLM2	
23.	Week 10: Drawing of Plan, Elevation & Section for Hospital Building. **Plan-4**	3	19-10-2024		TLM4	
24.	Building Bye- Laws	1	22-10-2024		TLM2	
25.	Week 11: Drawing of Plan, Elevation & Section for Industrial Building. **Plan-5**	3	26-10-2024		TLM4	
26.	Building Bye- Laws	1	29-10-2024		TLM2	
27.	LAB INTERNAL EXAM	3	02-11-2024			
28.	Revision	1	05-11-2024		TLM2	

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 J Venkatewararao
Signature				