LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)
Accredited by NAAC & NBA (CSE, IT, ECE, EEE & ME)
Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : P. Keerthi
Course Name : HIGHWAY ENGINEERING
Course Code : 20CE18
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CE., VI-Sem., A.Y : 2023-24

PRE-REQUISITE: NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The course aims to explore the students with elements of highway engineering like geometric elements, sight distances and gradients, properties of various highway materials and construction. The student will be able to design the various types of pavements and can easily control traffic generate on the highways.

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

CO 1	Understand the basic parameters of highway planning, geometric elements of highway and traffic studies (Understand-L2)
CO 2	Determine the geometric elements of highway alignment and pavement like flexible and rigid pavement. (Apply-L3)
CO 3	Identify the suitability of appropriate highway materials based on their properties(Understand-L2)
CO 4	Design the pavement thickness and elements of highway (Apply-L3)
CO 5	Understand the fundamentals of highway maintenance and traffic management (Understand-L2)

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

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

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

TEXT BOOKS:

T1 S.K. Khanna, and Justo, "Highway Engineering", Nem Chand and Bros, Roorkee, 10th edition, 2014.

T2 L.R. Kadiyali, "Traffic Engineering and Transport Planning", Khanna Publishers, 8th Edition, 2013.

REFERENCE BOOKS:

R1 Kadiyali,L.R.,"Principles and Practice of Highway Engineering", Khanna Publishers Ltd. New Delhi, 4th Edition, 2004.

R2 G. Venkatappa Rao, "Principles of transportation and Highway Engineering", Tata McGraw Hill Publishing Co. Ltd. New Delhi, 2000.

R3 Introduction to Transportation Engineering, NPTEL video lectures and web notes.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: HIGHWAY PLANNING AND ALIGNMENT

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.	History of road development in India	1	04.12.2023		TLM2	
2.	Jayakar committee recommendations	1	04.12.2023		TLM2	
3.	Institutions for Highway planning design and implementation at different levels	1	06.12.2023		TLM2	
4.	Road patterns	1	11.12.2023		TLM1	
5.	Engineering Surveys for Alignment	1	11.12.2023		TLM1	
6.	IRC classification of urban and rural roads	1	13.12.2023		TLM2	
7.	Preparation of detailed Project report	1	16.12.2023		TLM2	
8.	Highway cross sectional elements-	1	18.12.2023		TLM1	
9.	Camber, Kerbs, Shoulders and Footpaths.	1	18.12.2023		TLM2	
No. of classes required to complete UNIT-I: 09				No. of classes taken:		

UNIT-II: GEOMETRIC ELEMENTS

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	Geometric Standards	1	20.12.2023		TLM1	
11	Super elevation	1	23.12.2023		TLM1	
12	widening of pavements	1	27.12.2023		TLM1	
13	Transition curves	1	30.12.2023		TLM1	
14	Ruling, Limiting, Exceptional and Minimum Gradients	1	01.01.2024		TLM1	
15	Sight Distance	1	01.01.2024		TLM1	
16	Factors affecting Sight Distance	1	03.01.2024		TLM1	
17	PIEV Theory	1	06.01.2024		TLM1	
18	Stopping Sight Distance (SSD)	1	08.01.2024		TLM1	
19	Problems	1	08.01.2024			
20	Overtaking Sight Distance (OSD)	1	10.01.2024		TLM1	
21	Sight Distance at Intersection Geometric Design of Hill Roads.	1	17.01.2024		TLM1	
22	Problems	1	20.01.2024		TLM1	
No. of classes required to complete UNIT-II: 13				No. of classes taken:		

UNIT III: HIGHWAY MATERIALS AND CONSTRUCTION

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
23	Sub grade soil - Desirable properties	1	22.01.2024		TLM1	
24	California Bearing Ratio Test	1	22.01.2024		TLM1	
25	Field Density Test for soil	1	24.01.2024		TLM1	
26	Aggregates - Desirable properties	1	27.01.2024		TLM1	
27	Crushing, Abrasion test	1	29.01.2024		TLM4	
28	Impact Test for aggregates	1	29.01.2024		TLM4	
29	Bituminous materials – Desirable properties	1	31.01.2024		TLM1	
30	Penetration, Ductility,	1	03.02.2024		TLM4	
31	Viscosity, Binder content	1	05.02.2024		TLM4	
32	Softening point Test for bitumen		05.02.2024		TLM4	

33	Construction of Earth, Gravel Roads	1	07.02.2024		TLM2	
34	Construction of WBM, Bituminous Roads	1	12.02.2024		TLM2	
35	Cement Concrete roads as per IRC and MORTH specifications.	1	12.02.2024		TLM2	
No. of classes required to complete UNIT-III:13				No. of classes taken:		

UNIT-IV: HIGHWAY DESIGN AND MAINTENANCE

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	Design principles of Flexible and Rigid Pavements-Comparison	1	14.02.2024		TLM1	
37	Design of Flexible pavement	1	17.02.2024		TLM1	
38	CBR method	1	19.02.2024		TLM1	
39	IRC Recommendations	1	19.02.2024		TLM1	
40	Problems	1	21.02.2024		TLM1	
41	Design of Rigid Pavement	1	24.02.2024		TLM1	
42	IRC Recommendations	1	26.02.2024		TLM1	
43	Problems	1	26.02.2024		TLM1	
44	Defects in flexible pavements – surface defects, cracks, deformation, disintegration	1	28.02.2024		TLM2	
45	symptoms, causes and treatments	1	02.03.2024		TLM2	
46	Failures in rigid pavements – scaling, shrinkage, warping, structural cracks	1	04.03.2024		TLM2	
47	spalling of joints and mud pumping – special repairs.	1	04.03.2024		TLM2	
No. of classes required to complete UNIT-IV:12				No. of classes taken:		

UNIT-V: TRAFFIC ENGINEERING AND MANAGEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
48	Basic Parameters of Traffic-Volume, Speed and Density	1	06.03.2024		TLM2	
49	Traffic Volume Studies - Data Collection and Presentation	1	11.03.2024		TLM2	
50	Speed studies- Data Collection and Presentation	1	11.03.2024		TLM12	
51	Parking Studies and Parking characteristics	1	13.03.2024		TLM2	
52	Road Accidents-Causes and Preventive measures	1	16.03.2024		TLM2	
53	Accident Data Recording – Condition Diagram and Collision Diagrams	1	18.03.2024		TLM2	
54	Road Traffic Signs	1	18.03.2024		TLM2	
55	Types and Specifications	1	20.03.2024		TLM2	
56	Road Markings-Need for Road Markings	1	23.03.2024		TLM2	
57	Types of Road Markings	1	27.03.2024		TLM2	
58	Revision(Tutorial)	1	30.03.2024		TLM3	
No. of classes required to complete UNIT-V: 11				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulations):

Evaluation Task	**Marks**
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I, II & III)	M1=15
I-Quiz Examination (Units-I, II & III)	Q1=10
Assignment-III (Unit-III)	A3=5
Assignment-IV (Unit-IV)	A4=5
Assignment-V (Unit-V)	A5=5
II-Mid Examination (Units-III, IV & V)	M2=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
Mid Marks =75% of Max(M1,M2)+25% of Min(M1,M2)	M=15
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+M+Q	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 analyze and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and analyze the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Course Instructor	Course Coordinator	Module Coordinator	HOD
(P.Keerthi)	(P.Keerthi)	(B.Narasimha Rao)	(Dr.J.Venkateswara Rao)

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

PROGRAM	**:**	B.Tech., VI -Sem., CIVIL
ACADEMIC YEAR	**:**	2023-24
COURSE NAME & CODE	**:**	Design of Steel Structures (20CE19)
L-T-P STRUCTURE	**:**	2-1-0
COURSE CREDITS	**:**	3
COURSE INSTRUCTOR	**:**	Dr. K.V. Ramana
COURSE COORDINATOR	**:**	Dr. K.V. Ramana
PRE-REQUISITE	**:**	Strength of Materials-I, Strength of Materials-II, and Structural Analysis

Course Educational Objective:

This course serves as introduction to the concepts of structural steel design using IS 800 design code. It deals with the design of individual members and connections, such as, the design of tension members, compression members, beams, and beam columns; roof trusses and bolted, welded, and connections. The primary objective is to equip the students with the tools necessary for designing steel structures and to familiarize them with the relevant national design codes.

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

CO1: Identify the different structural steel elements such as steel members, loads on steel members, various steel connections, beams, tension and compression members, purlins, columns, truss elements, their relevant guidelines listed in appropriate Code books and their connection details **(Understand-L2)**

CO2: Design the different types of connections in steel members, compression and tension members**. (Apply-L3)**

CO3: Design the beams, column bases and built-up columns **(Apply-L3)**

CO4: Design the roof trusses and their components **(Apply-L3)**

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

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

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

BOS APPROVED TEXT BOOKS:

T1 N.Subramanian,"DesignofSteelStructures",OxfordUniversityPress,2nd Edition,2011

T2 S.K. Duggal, "DesignofSteelStructures",TataMcGrawHill,NewDelhi,3 rdEdition,2017

BOS APPROVED REFERENCE BOOKS:

1. S.S. Bhavikatti, "Design of Steel Structures", I.K. International Publishing House Pvt. Ltd, 4th Edition, 2014.
2. V.L. Shah and Veena Gore; "Limit State Design of steel structures IS: 800-2007"-, Structures Publications, 1st edition..
3. Design of Steel Structures, NPTEL video lectures and web notes

IS CODES:

1. IS-800–2007
2. IS-875(Part-III)
3. Steel Tables.

NOTE: These IS codes are permitted in the End Examinations

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Civil

UNIT-I: DESIGN OF STEEL CONNECTIONS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
1.	Fundamental Concepts of design of structures	1	04-12-2023		TLM-1	CO1	
2.	Different types of rolled steel sections available to be used in steel structures	2	05-12-2023 06-12-2023		TLM-1	CO1	
3.	Tutorial	1	07-12-2023		TLM3		
4.	I.S specifications, Stress Strain relationship for steel	2	8-12-2023 11-12-2023		TLM-1	CO1	
5.	Bolted Connections, Failure of a joint	2	12-12-2023 13-12-2023		TLM-1	CO1	
6.	Tutorial	1	14-12-2023		TLM3		
7.	Strength and efficiency of a joint	2	15-12-2023 18-12-2023		TLM-1	CO1	
8.	Design of Bearing type bolted joints subjected to axial load	2	19-12-2023 20-12-2023		TLM-1	CO1	
9.	Tutorial	1	21-12-2023		TLM3		
10.	Eccentric bolted connections	1	22-12-2023		TLM-1	CO1	
11.	Welded Connections, Types of welds	1	26-12-2023		TLM-1	CO1	
12.	stresses in welds	1	27-12-2023		TLM-1	CO1	
13.	Tutorial	1	28-12-2023		TLM3		
14.	Design of welded joints subjected to axial load	2	29-12-2023 01-01-2024		TLM-1	CO1	
15.	Eccentric welded connections	1	02-01-2024		TLM-1	CO1	
No. of classes required to complete UNIT-I: 21					No. of classes taken:		

UNIT-II: DESIGN OF TENSION AND COMPRESSION MEMBERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
16.	Design of Tension Members, Introduction,	1	03-01-2024		TLM-1	CO2	

	types of tension members						
17.	Tutorial	1	04-01-2024		TLM3		
18.	net sectional areas	1	05-01-2024		TLM-1	CO2	
19.	design of tension members	1	08-01-2024		TLM-1	CO2	
20.	lug angles and splices	1	09-01-2024		TLM-1	CO2	
21.	Design of Compression Members, Introduction, effective length and slenderness ratio	1	10-01-2024		TLM-1	CO2	
22.	Tutorial	1	11-01-2024		TLM3		
23.	various types of sections used for columns	1	12-01-2024		TLM-1	CO2	
24.	design of eccentrically loaded compression members	1	17-01-2024		TLM-1	CO2	
25.	Tutorial	1	18-01-2024		TLM3		
No. of classes required to complete UNIT-II: 10					No. of classes taken:		

UNIT-III: DESIGN OF BEAMS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
26.	Introduction, types of sections	1	19-01-2024		TLM-1	CO3	
27.	general design criteria for beams	1	22-01-2024		TLM-1	CO3	
28.	design of laterally supported and unsupported beams	2	23-01-2024 24-01-2024		TLM-1	CO3	
29.	Tutorial	1	25-01-2024		TLM3		
30.	Design of built-up sections	2	05-02-2024 06-02-2024		TLM-1	CO3	
31.	Design of built-up sections	1	07-02-2024		TLM-1	CO3	
32.	Tutorial	1	08-02-2024		TLM3		
33.	Curtailment of flange plates	2	09-02-2024 12-02-2024		TLM-1	CO3	
34.	web buckling	2	13-02-2024 14-02-2024		TLM-1	CO3	
35.	Tutorial	1	15-02-2024		TLM3		

36.	Web crippling	2	16-02-2024 19-02-2024		TLM-1	CO3	
No. of classes required to complete UNIT-III : 16					No. of classes taken:		

UNIT-IV: BUILT UP COLUMNS AND COLUMN BASES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
37.	Built-Up Columns, Necessity	2	20-02-2024 21-02-2024		TLM-1	CO3	
38.	Tutorial	1	22-02-2024		TLM3		
39.	design of built-up columns	2	23-02-2024 26-02-2024		TLM-1	CO3	
40.	laced and battened columns	2	27-02-2024 28-02-2024		TLM-1	CO3	
41.	Tutorial	1	29-02-2024		TLM3		
42.	design of lacing and battens	2	01-03-2024 04-03-2024		TLM-1	CO3	
43.	Column Bases, Introduction	2	05-03-2024 06-03-2024		TLM-1	CO3	
44.	Tutorial	1	07-03-2024		TLM3		
45.	types of column bases	1	11-03-2024		TLM-1	CO3	
46.	design of slab base and gusseted base	1	12-03-2024		TLM-1	CO3	
47.	Design of gusseted base subjected to eccentrically loading	1	13-03-2024		TLM-1	CO3	
48.	Tutorial	1	14-03-2024		TLM3		
No. of classes required to complete UNIT-IV:17					No. of classes taken:		

UNIT-V: ROOF TRUSSES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
49.	Types of trusses, Economical spacing of roof trusses	2	15-03-2024 18-03-2024		TLM-1	CO4	
50.	loads on roof trusses	2	19-03-2024 20-03-2024		TLM-1	CO4	
51.	Tutorial	1	21-03-2024		TLM3		
52.	Estimation of wind load on roof trusses as per IS:875	1	22-03-2024		TLM-1	CO4	
53.	Design of members of roof truss and joints	1	26-03-2024		TLM-1	CO4	

54.	Design of purlins	1	27-03-2024		TLM-1	CO4	
55.	Tutorial	1	28-03-2024		TLM3		
No. of classes required to complete UNIT-V:09					No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**
(Dr. K.V.Ramana)	(Dr. K.V.Ramana)	(C.Rajamallu)	(Dr. JVR)

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr.C Rajamallu
Course Name & Code : Estimation & Quantity Surveying-20CE20
L-T-P Structure : 2-1-0 **Credits :** 3
Program/Sem/Sec : B.Tech., CE., VI-Sem., Sections- A **A.Y** : 2023-2024

PRE-REQUISITE: Construction Management, DRCS-I, DRCS-II, Transportation Engineering-I, Transportation Engineering–II, Building Materials and Construction, and Foundation Engineering.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course aims to deal with the basic principles of estimating the quantities in building, roads and canals. The course also provides details about the procedures and practices for writing specifications, preparation of analysis of rates and procedural aspects of valuating the property.

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

CO 1	**Estimate** the quantities for various types of structures.
CO 2	**Calculate** the quantities of different items in buildings and roads.
CO 3	**Compute** the quantity estimate for canals.
CO 4	**Prepare** and write specifications and rate analysis.
CO 5	**Perform** valuation of the property as per the prevailing regulations.

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	-	-	3	-	-	-	-	-	-	-	-	3	1
CO2	-	-	2	-	-	-	-	-	-	-	-	-	2	-	-
CO3	1	-	-	-	3	-	-	2	-	-	-	-	1	2	-
CO4	-	-	1	-	-	-	2	-	-	-	-	-	-	-	1
CO4	-	1	-	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).

TEXT BOOKS:

T1 B.N. Dutta "Estimating & Costing in Civil Engineering", U. B. S. Publishers & Distributors, New Delhi. 2002

T2 S . C. Rangwala "Valuation of Real properties", Charotar Publishing House, 9th Edition, 2015.

REFERENCE BOOKS:

R1 M Chakraborthy, "Estimating, Costing Specification and Valuation", 2006

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: ESTIMATE OF BUILDINGS

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.	CO's and PO's	1	04-12-2023	04-12-2023	**TLM2**	
2.	Introduction to Estimation & methods of Estimating	1	05-12-2023	05-12-2023	**TLM2**	
3.	Tutorial	1	06-12-2023	06-12-2023	**TLM3**	
4.	Main items of work, Units of Measurements	1	08-12-2023	08-12-2023	**TLM2**	
5.	Different methods of Estimating	1	09-12-2023	09-12-2023	**TLM2**	
6.	Deduction for openings, Degree of accuracy	1	11-12-2023	11-12-2023	**TLM2**	
7.	Methods of building estimates, Individual wall method	1	12-12-2023	12-12-2023	**TLM1**	
8.	Tutorial	1	13-12-2023	13-12-2023	**TLM3**	
9.	Individual wall method problems	2	15-12-2023	15-12-2023	**TLM1**	
10.	Centre line method procedure & problems	1	16-12-2023	16-12-2023	**TLM1**	
11.	Arch masonry calculations	1	18-12-2023	18-12-2023	**TLM1**	
12.	Tutorial	1	19-12-2023	19-12-2023	**TLM3**	
13.	Estimate of steps	1	20-12-2023	20-12-2023	**TLM1**	
14.	Tutorial	1	22-12-2023	22-12-2023	**TLM3**	
15.	Estimate of a building from line plans	1	23-12-2023		**TLM1**	
No. of classes required to complete UNIT-I: 16				No. of classes taken:		

UNIT-II: ESTIMATE OF RCC WORKS AND ROADS

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.	Estimate of RCC Works introduction	1	26-12-2023		**TLM2**	
2.	Standard hooks & cranks in RCC	1	27-12-2023		**TLM2**	
3.	Estimate of RCC slab	1	29-12-2023		**TLM1**	
4.	Tutorial	1	30-12-2023		**TLM3**	
5.	Estimate of RCC Beam	1	02-01-2024		**TLM1**	
6.	Estimate of RCC T-Beam Slab	2	03-01-2024		**TLM1**	
7.	Tutorial	1	05-01-2024		**TLM3**	
8.	Estimate of RCC column with Foundation	1	06-01-2024		**TLM1**	
9.	Estimate of Pitching of slopes	1	08-01-2024		**TLM2**	
10.	Estimate of Earth work of road from longitudinal sections	2	09-01-2024		**TLM1**	
11.	Tutorial	1	10-01-2024		**TLM3**	
12.	Estimate of earth work in hill roads	2	12-01-2024		**TLM1**	
No. of classes required to complete UNIT-II:15				No. of classes taken:		

UNIT-III: CANAL ESTIMATE - SPECIFICATIONS

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

		Required	Completion	Completion	Methods	Weekly
1.	Purpose and method of writing specifications	1	16-01-2024		**TLM2**	
2.	General specifications & Detailed specifications for Brick work	1	17-01-2024		**TLM2**	
3.	Tutorial	1	19-01-2024		**TLM3**	
4.	Detailed specifications for RCC	1	20-01-2024		**TLM2**	
5.	Detailed specifications for Plastering	1	22-01-2024		**TLM2**	
6.	Detailed specifications for Mosaic flooring	1	23-01-2024		**TLM2**	
7.	Tutorial	1	24-01-2024		**TLM3**	
8.	Detailed specifications for R.R Stone masonry	1	27-01-2024		**TLM2**	
9.	Canal estimate-Earth work in canals different cases	1	05-02-2024		**TLM2**	
10.	Estimate of earth work in irrigation channels	1	06-02-2024		**TLM1**	
11.	Estimate of earth work in irrigation channels	1	07-02-2024		**TLM1**	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: ANALYSIS OF RATES- PWD ACCOUNTS AND PROCEDURE OF WORKS

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.	Analysis of rates-task or Out-turn work, Labour & material required for different works	1	09-02-2024 10-02-2024		**TLM2**	
2.	Preparing analysis of rates for Concrete & RCC works	1	12-02-2024 13-02-2024		**TLM1**	
3.	Preparing analysis of rates for Brick work in foundation & super structure	1	14-02-2024 16-02-2024		**TLM1**	
4.	Preparing analysis of rates for Plastering	1	17-02-2024		**TLM1**	
5.	Tutorial	1	19-02-2024 20-02-2024		**TLM3**	
6.	Preparing analysis of rates for CC flooring & White washing	1	21-02-2024		**TLM1**	
7.	Organization of Engineering department; Work charged establishment	1	23-02-2024 24-02-2024		**TLM1**	
8.	Contract; Tender; Tender notice; Tender Schedule	2	27-02-2024 28-02-2024		**TLM2**	
9.	Earnest money; Security money; Measurement book	1	29-02-2024		**TLM2**	
10.	Administrative approval; Technical sanction	1	01-03-2024 02-03-2024		**TLM1**	
11.	Plinth area; Floor Area; Carpet area	1	05-03-2024 06-03-2024		**TLM1**	
12.	Approximate Estimate; Plinth area estimate; Revised Estimate; Supplementary estimate	1	07-03-2024		**TLM2**	
13.	Tutorial	1	08-03-2024 12-03-2024		**TLM3**	

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

UNIT-V: VALUATION

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.	Cost, Price & value, Methods of valuation	1	13-03-2024 14-03-2024		**TLM2**	
2.	Outgoings, depreciation	1	15-03-2024		**TLM2**	
3.	Methods for estimating cost depreciation	2	16-03-2024		**TLM2**	
4.	Valuation of building & Gross income, Net income, Scrap value	2	19-03-2024		**TLM2**	
5.	Salvage value, Obsolescence	1	20-03-2024		**TLM2**	
6.	Tutorial	1	21-03-2024		**TLM3**	
7.	Life of structures, sinking fund	1	22-03-2024		**TLM3**	
8.	Capitalized value, Years purchase, Standard rent	2	23-03-2024		**TLM2**	
9.	Process of fixing standard rent,	1	26-03-2024		**TLM2**	
10.	Tutorial	1	27-03-2024		**TLM3**	
11.	Annuity & Mortgage	1	28-03-2024		**TLM3**	
No. of classes required to complete UNIT-V:14				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulations):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering
PSO 2	Possesses ability to plan, examine and 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 C. Rajamallu**	**Dr C. Rajamallu**	**Dr C. Rajamallu**	**Dr.J.Venkateswara Rao**
Signature				

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: K. HARISH KUMAR
Course Name & Code **:** Construction Management & 20CE22
L-T-P Structure **: 3-0-0** **Credits:** 3
Program/Sem/Sec : B.Tech, VI SEM, CE **A.Y.:** 2023-24

PREREQUISITE: NILL

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course aims to get exposure to management of various projects and financial facilities, and to plan and organize for any project. The course also provides proper utilization of equipments, materials and labor, the procedure of scheduling, the programming of any project by network analysis.

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

CO1	Identify the project characteristics, planning, organization and various stages of a project. (Remember-L1)
CO2	Develop the abilities in project scheduling, controlling & evaluation techniques like PERT, CPM etc. while dealing with a project (Apply-L3)
CO3	Discern the principles of material management, equipment and labour management, inventory and productivity. (Understand-L2)
CO4	Describe the fundamental elements of contracts and material procurement. (Understand-L2)

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

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

TEXTBOOKS:

T1 B.C. Punmia, "Project Planning and Control with PERT and CPM", Laxmi Publications, New Delhi, 1987.

T2 S. Sanga Reddy and Meyyappan, "Construction Management", Kumaran Publications, 2009 Edition.

REFERENCE BOOKS:

R1 K.K. Chitkara, "Construction Project Management", Tata McGraw Hill Publishing Co, Ltd., New Delhi, 1992

R2 L.S. Srinath, “PERT & CPM: Principles and Applications”, Affiliated East-West Press, 3rd Edition, 2001.

R3 Construction Planning and Management & Construction and Contract Management, NPTEL

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: CONSTRUCTION PROJECT MANAGEMENT

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to CO's ,PO's & Basics of construction management	01	04.12.2023		**TLM2**	
2.	Project Life Cycle	01	05.12.2023		**TLM2**	
3.	Major Types of construction	01	08.12.2023		**TLM2**	
4.	Selection of professional services – Construction contractors	01	11.12.2023		**TLM2**	
5.	Stages in Construction	01	12.12.2023		**TLM2**	
6.	Financing of constructed facilities	01	15.12.2023		**TLM2**	
7.	Legal & Regulatory requirements	01	16.12.2023		**TLM2**	
8.	Role of project managers	01	18.12.2023		**TLM2**	
9.	Revision/Class test	01	19.12.2023		**TLM3**	
No. of classes required to complete UNIT-I: 09				**No. of classes taken:**		

UNIT-II: PROJECT PLANNING & ORGANIZATION

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.	Introduction to Project Planning	01	22.12.2023			
11.	Stages of planning	01	23.12.2023		**TLM2**	
12.	Objective, principles, advantages and limitation of planning	01	26.12.2023		**TLM2**	
13.	Programming – Types of plans	01	29.12.2023		**TLM2**	
14.	Introduction to Scheduling	01	30.12.2023		**TLM2**	
15.	Scheduling – Uses, advantages	01	02.01.2024		**TLM2**	
16.	Bar chart, milestone charts	01	05.01.2024		**TLM2**	
17.	Examples on Bar chart, milestone charts	01	06.01.2024		**TLM2**	
18.	Project Organization – its types	01	08.01.2024		**TLM2**	
19.	Project budget fund flow statement	01	09.01.2024		**TLM2**	
20.	Controlling system	01	12.01.2024		**TLM2**	
21.	Revision/Class test	01	16.01.2024		**TLM3**	
No. of classes required to complete UNIT-II: 12				**No. of classes taken:**		

UNIT-III: LABOUR, MATERIAL & EQUIPMENT UTILIZATION

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
22.	Introduction – Productivity	01	19.01.2024		**TLM2**	
23.	Labour Productivity	01	20.01.2024		**TLM2**	
24.	Factors affecting job site productivity	01	22.01.2024		**TLM2**	
25.	Introduction – Materials Management-Objectives, functions & uses	01	23.01.2024		**TLM2**	
26.	Introduction – Material procurement & Delivery	01	27.01.2024		**TLM2**	

	MID – I Examination	**29.01.2024- 03.02.2024**				
27.	Approaches to Material procurement & Delivery	01	05.02.2024		**TLM2**	
28.	Inventory control – benefits, objectives	01	06.02.2024		**TLM2**	
29.	Revision	01	09.02.2024		**TLM3**	
30.	Plant & Equipment management	01	12.02.2024		**TLM2**	
31.	Advantages, factors	01	13.02.2024		**TLM2**	
32.	Revision/Class test	01	16.02.2024		**TLM3**	
No. of classes required to complete UNIT-III:11				**No. of classes taken:**		

UNIT-IV: NETWORK ANALYSIS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
33.	Introduction - Network Analysis	01	17.02.2024		**TLM1**	
34.	Basic concepts of network analysis	01	19.02.2024		**TLM1**	
35.	Introduction - CPM & PERT	01	20.02.2024		**TLM1**	
36.	Use & applications of CPM & PERT Techniques	01	23.02.2024		**TLM1**	
37.	Problems - CPM	01	24.02.2024		**TLM1**	
38.	Problems - CPM	01	26.02.2024		**TLM1**	
39.	Problems - PERT	01	27.02.2024		**TLM1**	
40.	Problems - PERT	01	01.03.2024		**TLM1**	
41.	Introduction-software application	01	02.03.2024		**TLM1**	
42.	Revision/Class test	01	04.03.2024		**TLM1**	
No. of classes required to complete UNIT-IV: 10				**No. of classes taken:**		

UNIT-V: CONTRACTS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
43.	Introduction - Contracts	01	05.03.2024		**TLM2**	
44.	Types of Contract – Contract document	01	11.03.2024		**TLM2**	
45.	Specifications – Important conditions of contract	01	12.03.2024		**TLM1**	
46.	Tender and tender document	02	15.03.2024 16.03.2024		**TLM1**	
47.	Deposits by the contractor	01	18.03.2024		**TLM1**	
48.	M. Book, R.A Bills & Advances – Muster Roll	01	19.03.2024		**TLM2**	
49.	Arbitration, Stores – e-Procurement.	01	22.03.2024		**TLM2**	
50.	Revision/Class test	01	23.03.2024		**TLM3**	
51.	Revision	01	26.03.2024		**TLM3**	
52.	Revision	01	30.03.2024		**TLM3**	
	MID – II Examination	**01.04.2024 – 06.04.2024**				
No. of classes required to complete UNIT-V: 11				**No. of classes taken:**		

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO 1	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**	**Module Coordinator**	**Head of the Department**
Name of the Faculty	**KHK**	**CR**	**Dr. JVR**
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 INFORMATION AND TECHNOLOGY

COURSE HANDOUT

PART-A

Name of Course Instructor: M. Vijay Kumar

Course Name & Code **:** CYBER SECURITY AND DIGITAL FORENSICS & 201T84
L-T-P Structure **: 3-0-0** **Credits:** 03
Program/Sem/Sec : B.Tech-Civil / VI SEM
A.Y. **:** 2023-24

PRE-REQUISITE: Understanding of digital logic, operating system concepts, Computer hardware knowledge.

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of the course is to provide the basic concepts of cybersecurity and digital Forensics which help to protect ourselves from various kinds of cyber-attacks. Digital forensics is a branch of forensics science encompassing the recovery and investigation of material found in digital devices, often in relaxation to computer crime. It enables students to gain experience to do independent study and research

CO1	Understand the implementation of cybercrime. **(Understand - L2)**
CO2	Identify key Tools and Methods used in Cybercrime. **(Remember- L1)**
CO3	Under the Concepts of Cyber Forensics. **(Understand- L2)**
CO4	Apply Cyber Forensics in collection of digital evidence and sources of evidence **(Apply- L3)**
CO5	Analyze the cyber forensics tools for present and future**(Analyze- L4)**

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

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

1- Slight(Low), **2 –**Moderate(Medium), **3 -** Substantial (High).

BOS APPROVED TEXT BOOKS:

1. Dejey, Dr.Murugan, "cyber Forensics", Oxford University Press, India, 2018

2. Sunit Belapure Nina Godbole "Cyber Security: Understanding Cyber Crimes, Computer Forensics and Legal Perspectives", WILEY,2011

BOS APPROVED REFERENCE BOOKS:

1. Michael Simpson, Kent Blackman and James e. Corley, "Hands on Ethical Hacking and Network Defense", Cengage, 2019

2. Computer Forensics, Computer Crime Investigation by John R.Vacca, Firewall Media, New Delhi

3. Alfred Basta, Nadine Basta, Mary Brown and Ravindra Kumar "Cyber Security and Cyber Laws", Cengage, 2018

Part-B

COURSE DELIVERY PLAN (LESSON PLAN): Section A

UNIT-I: Introduction to Cybercrime

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
1	Introduction to CSDF	1	11-12-2023		**TLM2**	CO1	
2	Cybercrime definition and origins of the word	1	12-12-2023		**TLM2**	CO1	
3	Cybercrime and Information Security	1	13-12-2023		**TLM2**	CO1	
4	Cybercriminals	1	15-12-2023		**TLM2**	CO1	
5	Classifications of Cybercrime	1	18-12-2023		**TLM2**	CO1	
6	Cyberstalking Cybercafé and Cybercrime	1	19-12-2023 20-12-2023		**TLM2**	CO1	
7	Botnets Security Challenges Posed by Mobile	2	20-12-2023 22-12-2023		**TLM2**	CO1	
8	Attacks on Mobile/Cell Phones Network and Computer Attacks	1	26-12-2023		**TLM2**	CO1	
9	Unit-I Assignment Test	1	27-12-2023		**TLM2**	CO1	
No. of classes required to complete UNIT-I		10	No. of classes taken:				

UNIT-II: Tools and Methods

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
10	Proxy Servers and Anonymizers	1	29-01-2024		**TLM2**	CO2	
11	Phishing, Password Cracking	1	02-01-2024		**TLM2**	CO2	
12	Key loggers and Spywares Virus and Worms	1	03-01-2024		**TLM2**	CO2	
13	Trojan Horses and Backdoors Steganography	1	05-01-2024		**TLM2**	CO2	
14	Sniffers, Spoofing, session Hijacking Buffer Overflow Identity Theft	2	08-01-2024 09-01-2024		**TLM1**	CO2	
15	Dos and DDos Attacks SQL Injection Port Scanning	2	10-01-2024 12-01-2024		**TLM2**	CO2	
16	Unit-II Assignment Test	1	19-01-2024		**TLM2**	CO2	
No. of classes required to complete UNIT-2		09	No. of classes taken:				

UNIT – III: Cyber Forensics

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
17	Cyber Forensics Definition	1	22-01-2024		**TLM2**	CO3	
18	Disk Forensics	1	23-01-2024		**TLM**	CO3	
19	Network Forensics	1	24-01-2024		**TLM2**	CO3	
20	Wireless Forensics	1	05-02-2024		**TLM2**	CO3	

21	Database Forensics	1	06-02-2024		**TLM2**	CO3	
22	Malware Forensics	1	07-02-2024		**TLM2**	CO3	
23	Mobile Forensics	1	09-02-2024		**TLM2**	CO3	
24	Email Forensics	1	12-02-2024		**TLM1**	CO3	
25	Unit-III Assignment Test	1	13-02-2024		**TLM2**	CO3	
No. of classes required to complete UNIT-3		9	No. of classes taken:				

UNIT-IV: Digital Evidence

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
26	Introduction to Digital Evidence and Evidence Collection procedure	2	14-02-2024 16-02-2024		**TLM2**	CO4	
27	Source of Evidence Operating systems and their Boot Processes	2	19-02-2024 20-02-2024		**TLM2**	CO4	
28	File System Windows Registry	2	21-02-2024 23-02-2024		**TLM1**	CO4	
29	Windows Artifacts Browser Artifact	2	26-02-2024 27-02-2024		**TLM2**	CO4	
30	Linux Artifact	2	28-02-2024 01-03-2024		**TLM1**	CO4	
31	Digital evidence on the internet	2	04-03-2024 05-03-2024		**TLM2**	CO4	
32	Impediments to collection of Digital Evidence	1	06-03-2024		**TLM1**	CO4	
33	Challenges with Digital Evidence	2	11-03-2024 12-03-2024		**TLM2**	CO4	

34	Unit-III Assignment Test	1	13-03-2024		**TLM2**	CO4	
No. of classes required to complete UNIT-4		16	No. of classes taken:				

UNIT-V: Cyber Forensics

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcomes	HOD Sign Weekly
35	The Present and The Future Forensics Tools	1	15-03-2024		**TLM2**	CO5	
36	Cyber Forensics suite Imaging and Validation Tools	1	18-03-2024		**TLM2**	CO5	
37	Tools for Integrity Verification and Hashing	1	19-03-2024		**TLM2**	CO5	
38	Forensics Tools for Data Recovery Encryption/decryption	1	20-03-2024		**TLM2**	CO5	
39	Forensics tools for Password Recovery Analyzing network	2	22-03-2024 26-03-2024		**TLM1**	CO5	
40	Forensics Tools for Email Analysis	1	27-03-2024		**TLM2**	CO5	
41	Unit -5 Assignment test.	1	28-03-2024		**TLM2**	CO5	
No. of classes required to complete UNIT-5		8	No. of classes taken:				

Contents beyond the Syllabus

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign
1.	Clouds & its types and storages	2			TLM2	

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

Part – C

EVALUATION PROCESS:

Evaluation Task	Marks
Assignment-I (Units-I, II & 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+A	M=30
Cumulative Internal Examination (CIE): M	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

ACADEMIC CALENDAR:

Description	From	To	Weeks
Commencement of Class Work	03-07-2022		
I Phase of Instructions	04-12-2023	27-01-2024	8W
I Mid Examinations	29-01-2024	03-02-2024	1W
II Phase of Instructions	05-02-2024	30-03-2024	8W
II Mid Examinations	01-04-2024	06-04-2024	1W
Preparation and Practical's	08-04-2024	13-04-2024	1W
Semester End Examinations	15-04-2023	27-04-2024	2W
Internship	29-04-2024	22-06-2024	8W

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

PEO 1	Pursue a successful career in the area of Information Technology or its allied fields.
PEO 2	Exhibit sound knowledge in the fundamentals of Information Technology and apply practical experience with programming techniques to solve real world problems.
PEO 3	Able to demonstrate self-learning, life-long learning and work in teams on multidisciplinary projects.
PEO 4	Able to understand the professional code of ethics and demonstrate ethical behavior, effective communication and team work and leadership skills in their job.

PROGRAMME 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 solution sin 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.

PROGRAMME SPECIFIC OUTCOMES (PSOs)

PSO1 Organize, Analyze and Interpret the data to extract meaningful conclusions.

PSO2 Design, Implement and Evaluate a computer-based system to meet desired needs.

PSO3 Develop IT application services with the help of different current engineering tools.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	M Vijay Kumar			
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)
L.B.REDDY NAGAR, MYLAVARAM-521 230, A.P, INDIA
DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PROGRAM	**:**	B.Tech., VI-Sem., CIVIL
ACADEMIC YEAR	**:**	2023-24
COURSE NAME & CODE	**:**	Quantity Estimation & Project Management Lab (20CE62)
L-T-P STRUCTURE	**:**	0-0-3
COURSE CREDITS	**:**	1.5
COURSE INSTRUCTOR	**:**	**Dr C Rajamallu,** P. M. Ganga Raju,
COURSE COORDINATOR	**:**	**Dr C Rajamallu**
PRE-REQUISITE	**:**	Estimation & Quantity Surveying

COURSE EDUCATIONAL OBJECTIVE:
The course deals with usage of software tools for calculating the quantities and estimating the cost of different structures. It also deals with managing the project by using software tools.

COURSE OUTCOMES (CO) :

1. Estimate the quantities for different items of civil engineering using software tools.
2. Prepare the estimate of different items of RCC elements.
3. Control the project for execution of civil engineering projects through systematic planning.

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	2	2		3	2							3	3		2
CO2	2	2		3	2							3	3		2
CO3	2	2		3	2							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).

QUANTITY ESTIMATION AND PROJECT MANAGEMENT LAB

LIST OF EXPERIMENTS

COURSE: VI SEMESTER **A.Y: 2023-24**

1. Quantity estimation of a single storey residential building (different items).
2. Cost estimation of a single storey residential building.
3. Quantity estimation of a B.T.Road (different items).
4. Cost estimation of a B.T.Road.
6. Quantity estimation of RCC roof slab and preparing schedule of bars.
7. Quantity estimation of RCC beam and preparing schedule of bars.
8. Quantity estimation of RCC Column with foundation footing and preparing schedule of bars.
9. Preparing the Project management report for a single storey residential building/Road/Canal by using the Bar Chart/Mile stone chart.
10. Preparing the Project management report for a single storey residential building by using the network technique (PERT/CPM).
11. Preparing the Project management report for a B.T.Road by using the network technique (PERT/CPM).

QUANTITY ESTIMATION AND PROJECT MANAGEMENT LAB

COURSE: VI SEMESTER **A.Y: 2023-24**

LAB SCHEDULE

Sl.No	Name of the Experiment	Tentative Date	Actual Date
1	Quantity estimation of a single storey residential building (different items).	07-12-2024	07-12-2024
2	Cost estimation of a single storey residential building.	14-12-2024	14-12-2024
3	Quantity estimation of a B.T.Road (different items).	21-12-2024	21-12-2024
4	Cost estimation of a B.T.Road.	28-12-2023	28-12-2023
5	Quantity estimation of RCC roof slab and preparing schedule of bars.	04-01-2024	04-01-2024
6	Quantity estimation of RCC beam and preparing schedule of bars.	18-01-2024	18-01-2024
7	Quantity estimation of RCC Column with foundation and preparing schedule of bars.	25-1-2024	
8	Preparing the Project management report for a single storey residential building/Road/Canal by using the Bar Chart/Mile stone chart.	08-02-2024	
9	Preparing the Project management report for a single storey residential building by using the network technique (PERT/CPM).	15-02-2024	
10	Preparing the Project management report for a B.T.Road by using the network technique (PERT/CPM).	22-02-2024	
11	Revision	29-02-2024	
12	Revision	07-03-2024	

PROGRAM OUTCOMES (PO'S)

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

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

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

4. Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.

5. Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations.

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

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

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

9. Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.

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

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

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

PROGRAM SPECIFIC OUTCOMES FOR CIVIL ENGINEERING

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 analyse 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	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
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Approved by AICTE, New Delhi and Affiliated to JNTUK, Kakinada
L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

COURSE HANDOUT

PROGRAM	**:**	B.Tech., VI-Sem., CIVIL
ACADEMIC YEAR	**:**	2023-24
COURSE NAME & CODE	**:**	HIGHWAY ENGINEERING LAB (20CE63)
L-T-P STRUCTURE	**:**	0-0-3
COURSE CREDITS	**:**	1.5
COURSE INSTRUCTOR	**:**	P. KEERTHI
COURSE COORDINATOR	**:**	P. KEERTHI
PRE-REQUISITE	**:**	Nil

COURSE OBJECTIVE:

This course aims to identify the properties of different materials used in highway construction and makes students to identify the grades of materials.

COURSE OUTCOMES:

CO1: Categorize and analyze the properties of road aggregates
CO2: Determine and analyze the properties of bitumen
CO3: Determine the suitability of aggregates and bitumen for pavement designs

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	1	-	-	-	-	-	1	-	-	1	-	-	-	2	1
CO2	1	-	-	-	-	-	1	-	-	1	-	-	-	2	-
CO3	1	-	-	-	-	-	1	-	-	1	-	-	-	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).

20CE63 – HIGHWAY ENGINEERING LAB

Course Instructor(s): P. KEERTHI B.Tech (VI Sem)

J. RANGAIAH A.Y 2023-24

CYCLE-1

TESTS ON ROAD AGGREGATES

C-1-1. Aggregate Crushing value test

C-1-2. Aggregate Impact test

C-1-3. Specific Gravity and Water Absorption tests

C-1-4. Deval's Attrition Test

C-1-5. Los Angeles Abrasion test

C-1-6. Shape tests (a) Flakiness index (b) Elongation index

CYCLE-2

TESTS ON BITUMINOUS MATERIALS

C-2-1. Penetration test

C-2-2. Ductility test

C-2-3. Softening point test

C-2-4. Viscosity test

C-2-5. Bitumen content by centrifugal extractor

C-2-6. Specific gravity of bitumen

C-2-7. Flash and fire point tests

INCHARGE **HOD**

20CE63 – HIGHWAY ENGINEERING LAB

Course Instructor(s): P. KEERTHI B.Tech (VI Sem)

J. RANGAIAH A.Y 2023-24

Batch-A

Tentative Date/Batch	Actual date	A1	A2	A3	A4	A5	A6
07.12.2023		Introduction	Introduction	Introduction	Introduction	Introduction	Introduction
14.12.2023		C-1-1	C-1-2	C-1-3	C-1-4	C-1-5	C-1-6
21.12.2023		C-1-2	C-1-3	C-1-4	C-1-5	C-1-6	C-1-1
28.12.2023		C-1-3	C-1-4	C-1-5	C-1-6	C-1-1	C-1-2
04.01.2024		C-1-4	C-1-5	C-1-6	C-1-1	C-1-2	C-1-3
11.01.2024		C-1-5	C-1-6	C-1-1	C-1-2	C-1-3	C-1-4
18.01.2024		C-1-6	C-1-1	C-1-2	C-1-3	C-1-4	C-1-5
25.01.2024		C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6
08.02.2024		C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-1
15.02.2024		C-2-3	C-2-4	C-2-5	C-2-6	C-2-1	C-2-2
22.02.2024		C-2-4	C-2-5	C-2-6	C-2-1	C-2-2	C-2-3
29.02.2024		C-2-5	C-2-6	C-2-1	C-2-2	C-2-3	C-2-4
07.03.2024		C-2-6	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5
14.03.2024		C-2-7	C-2-7	C-2-7	C-2-7	C-2-7	C-2-7
21.03.2024		REPEATATION					
28.03.2024		REVISION					

20CE63 – HIGHWAY ENGINEERING LAB

Course Instructor(s): P. KEERTHI B.Tech (VI Sem)

J. RANGAIAH A.Y 2023-24

Batch-B

Date/Batch	Actual date	B1	B2	B3	B4	B5	B6
08.12.2023		C-1-1	C-1-2	C-1-3	C-1-4	C-1-5	C-1-6
15.12.2023		C-1-2	C-1-3	C-1-4	C-1-5	C-1-6	C-1-1
22.12.2023		C-1-3	C-1-4	C-1-5	C-1-6	C-1-1	C-1-2
29.12.2023		C-1-4	C-1-5	C-1-6	C-1-1	C-1-2	C-1-3
05.01.2024		C-1-5	C-1-6	C-1-1	C-1-2	C-1-3	C-1-4
12.01.2024		C-1-6	C-1-1	C-1-2	C-1-3	C-1-4	C-1-5
19.01.2024		C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6
09.02.2024		C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-1
16.02.2024		C-2-3	C-2-4	C-2-5	C-2-6	C-2-1	C-2-2
23.02.2024		C-2-4	C-2-5	C-2-6	C-2-1	C-2-2	C-2-3
01.03.2024		C-2-5	C-2-6	C-2-1	C-2-2	C-2-3	C-2-4
15.03.2024		C-2-6	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5
22.03.2024		C-2-7	C-2-7	C-2-7	C-2-7	C-2-7	C-2-7

INCHARGE **HOD**

PROGRAMME OUTCOMES (POs):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem analysis**: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
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PO 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.
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PO 7	**Environment and sustainability**: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	**Ethics**: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
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PO 12	**Life-long learning**: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**
(P. KEERTHI)	(P. KEERTHI)	(B.NARASIMHA RAO)	(Dr. J. VENKATESWARA RAO)

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
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HIGHWAY ENGINEERING LAB

COURSE : B.TECH (VI SEM) **A.Y : 2023-24**

LAB TIME TABLE

DAY	FN	AN
Monday		
Tuesday		
Wednesday		
Thursday		**VI Semister Batch-A**
Friday	**VI Semister Batch-B**	
Saturday		

Batch-A : 21761A0101 to 21761A0137

Batch-B : 21761A0138 to 22765A0125

Lab Incharge

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. K.V.RAMANA, Dr. J. Venkateswara Rao
Course Name & Code : COMPUTER AIDED ANALYSIS AND DESIGN LAB & 20CE64
L-T-P Structure : 0-0-3 Credits : 1.5
Program/Sem/Sec : B.Tech., CE., VI-Sem., A.Y : 2023-24

PRE-REQUISITE: Reinforced concrete structures, Design of steel structures, Auto CAD

COURSE EDUCATIONAL OBJECTIVES (CEOs): To impart hands on experience in design and preparation of structural drawings for concrete / steel structures normally encountered in Civil Engineering practice.

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

CO 1	Apply structural analysis software to analyze and design the beams, 2D and 3D frames.
CO 2	Design the retaining walls and foundations using STAAD Pro
CO 3	Draw the details of RCC and steel structural elements using AutoCAD

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	2	1			2			1		3	3	1
CO2	3	3	3	2	1			2			1		3	3	1
CO3	3	3	3	2	1			2			1		3	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

1. N. Subramanian, Design of Steel Structures, Oxford University Press, 2016.
2. Varghese, "Limit State Design of Reinforced Concrete", Prentice Hall of India Pvt., Ltd., New Delhi, 2002

REFERENCE BOOKS:

1. S.K.Duggal, Design of Steel Structures –Tata McGraw Hill, New Delhi, 2017.
2. Unni Krishnan Pillai and Devdas Menon, "**Reinforced concrete design**", Tata McGraw Hill Publishing company Ltd, New Delhi, 1998

List of experiments

S.No	Name of the experiments
1.	Reinforcement particulars of T-beams and L-beams.
2.	Reinforcement detailing of continuous beams
3.	Reinforcement particulars of columns.
4.	Detailing of Compound beams including curtailment of flange plates.
5.	Detailing of Column including lacing and battens
6.	Detailing of Beams including curtailment of flange plates
7.	Analysis and Design of different Beams
8.	2-D Frame Analysis and Design
9.	Design and analysis of multi-storied building
10.	Design of a different types of Retaining Walls
11.	3-D Frame Analysis and Design
12.	Analysis of plane/space truss

COMPUTER AIDED ANALYSIS AND DESIGN LAB A.Y: 2021-22

I–CYCLE SCHEDULE

Date / Batch	A	A	A	A	A	A
06-12-2023	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
13-12-2023	1	1	1	1	1	1
20-12-2023	2	2	2	2	2	2
27-12-2023	3	3	3	3	3	3
03-01-2024	4	4	4	4	4	4
10-01-2024	5	5	5	5	5	5
17-01-2024	6	6	6	6	6	6
24-01-2024	Repeat	Repeat	Repeat	Repeat	Repeat	Repeat

II CYCLE SCHEDULE

Date / Batch	A	A	A	A	A	A
07-02-2024	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
14-02-2024	7	7	7	7	7	7
21-02-2024	8	8	8	8	8	8
28-02-2024	9	9	9	9	9	9
06-03-2024	10	10	10	10	10	10
13-03-2024	11	11	11	11	11	11
20-03-2024	12	12	12	12	12	12
27-03-2024	Int. Test	Int. Test	Int. Test	Int. Test	Int. Test	Int. Test

Batch A (21761A0101 to 22765A0125), **Wednesday**

PROGRAMME OUTCOMES (POs):

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Course Instructor	Course Coordinator	Module Coordinator	HOD
(Dr. K.V. Ramana)	(Dr. K.V. Ramana)	(C. Rajamallu)	(Dr. JVR)

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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.
Phone: 08659-222933, Fax: 08659-222931

Department of Freshman Engineering

COURSE HANDOUT

PART-A

Name of Course Instructor: D. Chaithanya
Course Name & Code : Soft Skills & 20HSS1
L-T-P Structure : 1-0-2 **Credits:** 02
Program/Sem/Sec : B. Tech- VI SEM- CIVIL
Academic Year : 2023-24

PREREQUISITE: NIL

Course Educational Objectives:

The Soft Skills Laboratory course equips students with required behavioral, interpersonal & Intrapersonal skills, communication skills, leadership skills etc. It aims at training undergraduate students on soft skills leading to enhanced self-confidence, esteem, and acceptability in professional circles.

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

CO1	To Develop self-awareness and personality traits for professional growth.	L2
CO2	Work effectively in multi-disciplinary and heterogeneous teams through knowledge of teamwork, Inter-personal relationships, conflict management and leadership quality.	L3
CO3	Communicate through verbal/oral communication with good listening skills and empathy.	L3
CO4	Apply skills required to qualify in recruitment tests, Interviews & other professional assignments.	L3

COURSE ARTICULATION MATRIX
(Correlation between COs & POs)

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

List of Activities:

1. Personality Development Skills

Role of language in Personality – How language reflects, impacts Personality – Using gender- neutral language in MNCs – being Culturally-Sensitive-Personality Traits - Grooming & Dress code

Activities: Group Discussion/Role play/Presentations (authentic materials: Newspapers, pamphlets and News Clippings)

2. Impactful Communication

Activities: Extempore / Story Telling/ Group Discussion (Case studies/Current affairs etc.)/ Elocution on Interpretation of given quotes/ Critical Appreciation and Textual Analysis/ Writing reviews on short story/videos/book/Social Media profiling/ Pronunciation Practice

3. Professional Skills:

Career Planning- job vs. career- goal setting- SWOT Analysis-Time management – self-management – stress-management.

Activities: SWOT analysis of the self/Goal Setting-Presentation/Writing Report/Listening exercises/Effective Resume-Writing and presentation/ Interview Skills: Mock interviews/Video samples.

REFERENCES:

1. Edward Holffman, "Ace the Corporate Personality", McGraw Hill,2001
2. Adrian Furnham, Personality and Intelligence at Work, Psyc 2. hology Press, 2008.
3. M.Ashraf Rizvi, "Effective Technical Communication", 1 st edition, Tata cGrawHill, 2005.
4. Ace of Soft skills Gopalaswamy Ramesh, Pearson Education India, 2018
5. Soft Skills for the Workplace, Good heart - Willcox Publisher · 2020.
6. How to Win Friends and Influence People, Dale Carnegie · 2020

Software: Walden InfoTech

COURSE DELIVERY PLAN (LESSON PLAN)

S. No.	Topics to be covered	No. of Classes Required	Actual Date of Completion	HOD Sign
1.	Activity-1:Role of language in Personality- How language reflects, impacts Personality – Using gender	1+2	7/12/2023	
2.	neutral language in MNCs – being Culturally-Sensitive-Personality Traits - Grooming & Dress code& Role-play	1+2	14/12/2023	
3.	Group Discussion	1+2	21/12/2023	
4.	Presentations	1+2	28/12/2023	
5.	Activity-2: Impactful Communication Extempore - Story Telling	1+2	4/1/2024 11/1/2024	
6.	Extempore -Group Discussion	1+2	18/1/2024	
7.	Elocution on Interpretation of given quotes/ Critical Appreciation and Textual Analysis/ Writing	1+2	25/1/2024	
8.	reviews on short story/videos/book/Social Media profiling/ Pronunciation Practice	1+2	8/2/2024	
9.	Activity-3: Professional Skills: Career planning- job vs. career- goal setting	1+2	15/2/2024	
10.	SWOT Analysis	1+2	22/2/2024	
11.	Time management – self-management – stress-management.	1+2	29/2/2024	

12.	Presentation/Writing Report/Listening exercises	1+2	7/3/2024	
13.	Effective Resume-Writing and presentation	1+2	14/3/2024	
14.	Interview Skills: Mock interviews/Video samples.	1+2	21/3/2024	
15.	Interview Skills: Mock interviews/Video samples.	1+2	28/3/2024	
No. of classes required to complete Syllabus:				

Signature of Faculty Signature of HOD