



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 : 2022-23

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	26.12.2022		TLM1	
2.	Jayakar committee recommendations	1	27.12.2022		TLM1	
3.	Institutions for Highway planning design and implementation at different levels	1	29.12.2022		TLM1	
4.	Road patterns	1	30.12.2022		TLM1	
5.	Engineering Surveys for Alignment	1	02.01.2023		TLM1	
6.	IRC classification of urban and rural roads	1	03.01.2023		TLM1	
7.	Preparation of detailed Project report	1	05.01.2023		TLM1	
8.	Highway cross sectional elements- Right of way, Carriage way	1	06.01.2023		TLM1	
9.	Camber, Kerbs, Shoulders and Footpaths.	1	09.01.2023		TLM1	
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
1.	Geometric Standards	1	10.01.2023		TLM1	
2.	Super elevation	1	12.01.2023		TLM1	
3.	widening of pavements	1	19.01.2023		TLM1	
4.	Transition curves	1	20.01.2023		TLM1	
5.	Ruling, Limiting, Exceptional and Minimum Gradients	1	23.01.2023		TLM1	
6.	Sight Distance	1	24.01.2023		TLM1	
7.	Factors affecting Sight Distance	1	27.01.2023		TLM1	
8.	PIEV Theory	1	30.01.2023		TLM1	
9.	Stopping Sight Distance (SSD)	1	31.01.2023		TLM1	
10.	Overtaking Sight Distance (OSD)	1	02.02.2023		TLM1	
11.	Sight Distance at Intersection Geometric Design of Hill Roads.	1	03.02.2023		TLM1	
12.	Problems	1	06.02.2023		TLM1	
No. of classes required to complete UNIT-II: 12				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
1.	Sub grade soil - Desirable properties	1	07.02.2023		TLM1	
2.	California Bearing Ratio Test	1	09.02.2023		TLM1	
3.	Field Density Test for soil	1	10.02.2023		TLM1	
4.	Aggregates - Desirable properties	1	13.02.2023		TLM1	
5.	Crushing, Abrasion test	1	14.02.2023		TLM1	
6.	Impact Test for aggregates	1	16.02.2023		TLM1	
7.	Bituminous materials – Desirable properties	1	17.02.2023		TLM1	
8.	Penetration, Ductility,	1	27.02.2023		TLM1	
9.	Viscosity, Binder content	1	28.02.2023		TLM1	
10.	Softening point Test for bitumen		02.03.2023		TLM1	
11.	Construction of Earth, Gravel Roads	1	03.03.2023		TLM1	
12.	Construction of WBM, Bituminous Roads	1	06.03.2023		TLM1	

13.	Cement Concrete roads as per IRC and MORTH specifications.	1	07.03.2023		TLM1	
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
1.	Design principles of Flexible and Rigid Pavements-Comparison	1	09.03.2023		TLM1	
2.	Design of Flexible pavement	1	10.03.2023		TLM1	
3.	CBR method	1	13.03.2023		TLM1	
4.	IRC Recommendations	1	14.03.2023		TLM1	
5.	Problems	1	16.03.2023		TLM1	
6.	Design of Rigid Pavement	1	17.03.2023		TLM1	
7.	IRC Recommendations	1	20.03.2023		TLM1	
8.	Problems	1	21.03.2023		TLM1	
9.	Joints	1	23.03.2023		TLM1	
10.	Defects in flexible pavements – surface defects, cracks, deformation, disintegration	1	24.03.2023		TLM2	
11.	symptoms, causes and treatments	1	27.03.2023		TLM2	
12.	Failures in rigid pavements – scaling, shrinkage, warping, structural cracks, spalling of joints and mud pumping – special repairs.	1	28.03.2023		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
1.	Basic Parameters of Traffic-Volume, Speed and Density	1	31.03.2023		TLM2	
2.	Traffic Volume Studies - Data Collection and Presentation	1	03.04.2023		TLM2	
3.	Speed studies- Data Collection and Presentation	1	04.04.2023		TLM12	
4.	Parking Studies and	1	06.04.2023		TLM2	

	Parking characteristics				
5.	Road Accidents-Causes and Preventive measures	1	10.04.2023		TLM2
6.	Accident Data Recording – Condition Diagram and Collision Diagrams	1	11.04.2023		TLM2
7.	Road Traffic Signs	1	13.04.2023		TLM2
8.	Types and Specifications	1	17.04.2023		TLM2
9.	Road Markings-Need for Road Markings	1	18.04.2023		TLM2
10.	Types of Road Markings	1	20.04.2023		TLM2
11.	Revision(Tutorial)	1	21.04.2023		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
(P.Keerthi)

Course Coordinator
(P.Keerthi)

Module Coordinator
(J.Rangaiah)

HOD
(Dr.V.Ramakrishna)



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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

PROGRAM	: B.Tech., VI -Sem., CIVIL
ACADEMIC YEAR	: 2022-23
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, “Design of Steel Structures”, Oxford University Press, 2nd Edition, 2011

T2 S.K. Duggal, “Design of Steel Structures”, Tata McGraw Hill, New Delhi, 3rd Edition, 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	26-12-2022		TLM-1	CO1	
2.	Different types of rolled steel sections available to be used in steel structures	1	27-12-2022		TLM-1	CO1	
3.	I.S specifications, Stress Strain relationship for steel	2	28-12-2022 30-12-2022		TLM-1	CO1	
4.	Bolted Connections, Failure of a joint	2	31-12-2022 2-1-2023		TLM-1	CO1	
5.	Strength and efficiency of a joint	2	3-1-2023 4-1-2023		TLM-1	CO1	
6.	Design of Bearing type bolted joints subjected to axial load	2	6-1-2023 7-1-2023		TLM-1	CO1	
7.	Eccentric bolted connections	1	9-1-2023		TLM-1	CO1	
8.	Welded Connections, Types of welds	1	10-1-2023		TLM-1	CO1	
9.	stresses in welds	1	11-1-2023		TLM-1	CO1	
10.	Design of welded joints subjected to axial load	2	18-1-2023 20-1-2023		TLM-1	CO1	
11.	Eccentric welded connections	1	21-1-2023		TLM-1	CO1	
No. of classes required to complete UNIT-I:16					No. of classes taken: 16		

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
12.	Design of Tension Members, Introduction, types of tension members	1	23-1-2023		TLM-1	CO2	
13.	net sectional areas	1	24-1-2023		TLM-1	CO2	
14.	design of tension members	2	25-1-2023 27-1-2023		TLM-1	CO2	
15.	lug angles and splices	2	28-1-2023 30-1-2023		TLM-1	CO2	

16.	Design of Compression Members, Introduction, effective length and slenderness ratio	2	31-1-2023 1-2-2023		TLM-1	CO2	
17.	various types of sections used for columns	2	3-2-2023 4-2-2023		TLM-1	CO2	
18.	design of eccentrically loaded compression members	2	6-2-2023 7-2-2023		TLM-1	CO2	
No. of classes required to complete UNIT-II: 12					No. of classes taken: 11		

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
19.	Introduction, types of sections	1	8-2-2023		TLM-1	CO3	
20.	general design criteria for beams	1	10-2-2023		TLM-1	CO3	
21.	design of laterally supported and unsupported beams	2	11-2-2023 13-2-2023		TLM-1	CO3	
22.	Design of built-up sections	2	14-2-2023 15-2-2023		TLM-1	CO3	
23.	Curtailement of flange plates	2	17-2-2023 27-2-2023		TLM-1	CO3	
24.	web buckling	2	28-2-2023 1-3-2023		TLM-1	CO3	
25.	Web crippling	2	3-3-2023 4-3-2023		TLM-1	CO3	
No. of classes required to complete UNIT-III : 12					No. of classes taken: 11		

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
26.	Built-Up Columns, Necessity	2	6-3-2023 7-3-2023		TLM-1	CO4	
27.	design of builtup columns	2	8-3-2023 10-3-2023		TLM-1	CO4	
28.	laced and battened columns	2	11-3-2023 13-3-2023		TLM-1	CO4	
29.	design of lacing and battens	2	14-3-2023 15-3-2023		TLM-1	CO4	
30.	Column Bases, Introduction	2	17-3-2023 18-3-2023		TLM-1	CO4	
31.	types of column bases	2	20-3-2023 21-3-2023		TLM-1	CO4	

32.	design of slab base and gusseted base	2	22-3-2023 24-3-2023		TLM-1	CO4	
33.	Design of gusseted base subjected to eccentrically loading	2	25-3-2023 27-3-2023		TLM-1	CO4	
No. of classes required to complete UNIT-IV:16					No. of classes taken: 12		

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
34.	Types of trusses, Economical spacing of roof trusses	2	28-3-2023 29-3-2023		TLM-1	CO5	
35.	loads on roof trusses	2	31-3-2023 1-4-2023		TLM-1	CO5	
36.	Estimation of wind load on roof trusses as per IS:875	2	3-4-2023 4-4-2023		TLM-1	CO5	
37.	Design of members of roof truss and joints	2	5-4-2023 7-4-2023		TLM-1	CO5	
38.	Design of purlins	2	8-4-2023 10-4-2023		TLM-1	CO5	
No. of classes required to complete UNIT-V:10					No. of classes taken:9		

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.
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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 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
(Dr. K.V.Ramana)

Course Coordinator
(Dr. K.V.Ramana)

Module Coordinator
(B.RamaKrishna)

HOD
(Dr. V.RamaKrishna)



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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 : P Mohana Ganga Raju
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** : 2022-2023

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 Chakraborty, “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	26-12-2022		TLM2	
2.	Introduction to Estimation & methods of Estimating	1	27-12-2022		TLM2	
3.	Tutorial	1	28-12-2022		TLM3	
4.	Main items of work, Units of Measurements	1	29-12-2022		TLM2	
5.	Different methods of Estimating	1	31-12-2022		TLM2	
6.	Deduction for openings, Degree of accuracy	1	02-01-2023		TLM2	
7.	Methods of building estimates, Individual wall method	1	03-01-2023		TLM1	
8.	Tutorial	1	04-01-2023		TLM3	
9.	Individual wall method problems	2	05-01-2023, 07-01-2023		TLM1	
10.	Centre line method procedure & problems	1	09-01-2023		TLM1	
11.	Arch masonry calculations	1	10-01-2023		TLM1	
12.	Tutorial	1	11-01-2023		TLM3	
13.	Estimate of steps	1	12-01-2023		TLM1	
14.	Tutorial	1	18-01-2023		TLM3	
15.	Estimate of a building from line plans	1	19-01-2023		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	21-01-2023		TLM2	
2.	Standard hooks & cranks in RCC	1	23-01-2023		TLM2	
3.	Estimate of RCC slab	1	24-01-2023		TLM1	
4.	Tutorial	1	25-01-2023		TLM3	
5.	Estimate of RCC Beam	1	28-01-2023		TLM1	
6.	Estimate of RCC T-Beam Slab	2	30-01-2023, 31-01-2023		TLM1	
7.	Tutorial	1	01-02-2023		TLM3	
8.	Estimate of RCC column with Foundation	1	02-02-2023, 04-02-2023		TLM1	
9.	Estimate of Pitching of slopes	1	06-02-2023		TLM2	
10.	Estimate of Earth work of road from longitudinal sections	2	07-02-2023, 09-02-2023		TLM1	
11.	Tutorial	1	08-02-2023		TLM3	
12.	Estimate of earth work in hill roads	2	09-02-2023, 11-02-2023		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 Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Purpose and method of writing specifications	1	13-02-2023		TLM2	
2.	General specifications & Detailed specifications for Brick work	1	14-02-2023		TLM2	
3.	Tutorial	1	15-02-2023		TLM3	
4.	Detailed specifications for RCC	1	16-02-2023		TLM2	
5.	Detailed specifications for Plastering	1	27-02-2023		TLM2	
6.	Detailed specifications for Mosaic flooring	1	28-02-2023		TLM2	
7.	Tutorial	1	01-03-2023		TLM3	
8.	Detailed specifications for R.R Stone masonry	1	02-03-2023		TLM2	
9.	Canal estimate-Earth work in canals different cases	1	04-03-2023		TLM2	
10.	Estimate of earth work in irrigation channels	1	06-03-2023		TLM1	
11.	Estimate of earth work in irrigation channels	1	07-03-2023		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	09-03-2023		TLM2	
2.	Preparing analysis of rates for Concrete & RCC works	1	11-03-2023		TLM1	
3.	Preparing analysis of rates for Brick work in foundation & super structure	1	13-03-2023		TLM1	
4.	Preparing analysis of rates for Plastering	1	14-03-2023		TLM1	
5.	Tutorial	1	15-03-2023		TLM3	
6.	Preparing analysis of rates for CC flooring & White washing	1	16-03-2023		TLM1	
7.	Organization of Engineering department; Work charged establishment	1	18-03-2023		TLM1	
8.	Contract; Tender; Tender notice; Tender Schedule	2	20-03-2023, 21-03-2023		TLM2	
9.	Earnest money; Security money; Measurement book	1	23-03-2023		TLM2	
10.	Administrative approval; Technical sanction	1	25-03-2023		TLM1	
11.	Plinth area; Floor Area; Carpet area	1	27-03-2023		TLM1	
12.	Approximate Estimate; Plinth area estimate; Revised Estimate; Supplementary estimate	1	28-03-2023		TLM2	
13.	Tutorial	1	29-03-2023		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	01-04-2023		TLM2	
2.	Outgoings, depreciation	1	03-04-2023		TLM2	
3.	Methods for estimating cost depreciation	2	04-04-2023, 06-04-2023		TLM2	
4.	Valuation of building & Gross income, Net income, Scrap value	2	08-04-2023, 10-04-2023		TLM2	
5.	Salvage value, Obsolescence	1	11-04-2023		TLM2	
6.	Tutorial	1	12-04-2023		TLM3	
7.	Life of structures, sinking fund	1	13-04-2023		TLM3	
8.	Capitalized value, Years purchase, Standard rent	2	15-04-2023, 17-04-2023		TLM2	
9.	Process of fixing standard rent,	1	18-04-2023		TLM2	
10.	Tutorial	1	19-04-2023		TLM3	
11.	Annuity & Mortgage	1	20-04-2023		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	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	P. Mohanaganga Raju		B. Ramakrishna	Dr. V. Ramakrishna
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: 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.: 2022-23

PREREQUISITE: NIL

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	27.12.2022		TLM2	
2.	Project Life Cycle	01	28.12.2022		TLM2	
3.	Major Types of construction	01	29.12.2022		TLM2	
4.	Selection of professional services – Construction contractors	01	30.12.2022		TLM2	
5.	Stages in Construction	01	03.01.2023		TLM2	
6.	Financing of constructed facilities	01	04.01.2023		TLM2	
7.	Legal & Regulatory requirements	01	05.01.2023		TLM2	
8.	Role of project managers	01	06.01.2023		TLM2	
9.	TUTORIAL-I	01	10.01.2023		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	11.01.2023			
11.	Stages of planning	01	12.01.2023		TLM2	
12.	Objective, principles, advantages and limitation of planning	01	18.01.2023		TLM2	
13.	Programming – Types of plans	01	19.01.2023		TLM2	
14.	Introduction to Scheduling	01	20.01.2023		TLM2	
15.	Scheduling – Uses, advantages	01	24.01.2023		TLM2	
16.	Bar chart, milestone charts	01	25.01.2023		TLM2	
17.	Examples on Bar chart, milestone charts	01	27.01.2023		TLM2	
18.	Project Organization – its types	01	31.01.2023		TLM2	
19.	Project budget fund flow statement	01	01.02.2023		TLM2	
20.	Controlling system	01	02.02.2023		TLM2	
21.	TUTORIAL-II	01	03.02.2023		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	07.02.2023		TLM2	
23.	Labour Productivity	01	08.02.2023		TLM2	
24.	Factors affecting job site productivity	01	09.02.2023		TLM2	
25.	Introduction – Materials Management- Objectives, functions & uses	01	10.02.2023		TLM2	
26.	Introduction – Material procurement & Delivery	01	14.02.2023		TLM2	

27.	Approaches to Material procurement & Delivery	01	15.02.2023		TLM2	
28.	Inventory control – benefits, objectives	01	16.02.2023		TLM2	
29.	Revision	01	17.02.2023		TLM3	
30.	MID – I Examination	20.02.2023- 25.02.2023				
31.	Plant & Equipment management	01	28.02.2023		TLM2	
32.	Advantages, factors	01	01.03.2023		TLM2	
33.	TUTORIAL-III	01	02.03.2023		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
MID – I Examination		26.09.2022 – 01.10.2022				
34.	Introduction - Network Analysis	01	03.03.2023		TLM1	
35.	Basic concepts of network analysis	01	07.03.2023		TLM1	
36.	Introduction - CPM & PERT	01	09.03.2023		TLM1	
37.	Use & applications of CPM & PERT Techniques	01	10.03.2023		TLM1	
38.	Problems - CPM	01	14.03.2023		TLM1	
39.	Problems - CPM	01	15.03.2023		TLM1	
40.	Problems - PERT	01	16.03.2023		TLM1	
41.	Problems - PERT	01	17.03.2023		TLM1	
42.	Introduction-software application	01	18.03.2023		TLM1	
43.	TUTORIAL-IV	01	21.03.2023		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
44.	Introduction - Contracts	01	23.03.2023		TLM2	
45.	Types of Contract – Contract document	01	24.03.2023		TLM2	
46.	Specifications – Important conditions of contract	01	28.03.2023		TLM1	
47.	Tender and tender document	02	29.03.2023 04.04.2023		TLM1	
48.	Deposits by the contractor	01	06.04.2023		TLM1	
49.	M. Book, R.A Bills & Advances – Muster Roll	01	11.04.2023		TLM2	
50.	Stores – e-Procurement.	01	12.04.2023		TLM2	
51.	TUTORIAL-VI	01	13.04.2023		TLM3	
52.	Revision	02	18.04.2023 19.04.2023		TLM3	
53.	Revision	02	20.04.2023 21.04.2023		TLM3	
MID – II Examination		24.04.2023 – 29.04.2023				
No. of classes required to complete UNIT-V: 09				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (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	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	KHK	KHK	BRK	Dr. VRK
Signature				



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

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Accredited by NAAC and NBA (CSE, IT, ECE, EEE & ME) under Tier - I



DEPARTMENT OF MECHANICAL ENGINEERING COURSE HANDOUT

Part-A

PROGRAM : B.Tech., VI-Sem., CIVIL
ACADEMIC YEAR : 2022-23
COURSE NAME & CODE : RENEWABLE ENERGY SOURCES- 20ME81
L-T-P STRUCTURE : 4-0-0
COURSE CREDITS : 3
COURSE INSTRUCTOR : KAMALA PRIYA B
COURSE COORDINATOR : Dr V Dhana Raju
PRE-REQUISITES: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): To provide the insights on different non-conventional energy sources, potential, salient features and utilization of solar, wind, geothermal, ocean thermal energy, bio energy and direct energy conversion systems.

COURSE OUTCOMES (COs)

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

CO1: Compute the performance of solar energy harnessing devices and its energy scenario. **(Applying- L3)**

CO2: Apply the principles of energy conversion for wind and geothermal power generating plants. **(Applying - L3)**

CO3: Compare the power generating capacities of tidal energy, wave energy and ocean thermal energy plants. **(Understanding - L2)**

CO4: Illustrate the various biomass power generation system technologies. **(Understanding - L2)**

CO5: Comprehend the direct energy power generation systems. **(Understanding - 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	-	-	-	3	3	-	-	-	-	2	2	-	-
CO2	2	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO3	1	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO4	1	1	-	-	-	3	3	-	-	-	-	2	2	-	-
CO5	1	1	-	-	-	3	3	-	-	-	-	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).

BOS APPROVED TEXT BOOKS:

T1 G.D.Rai, Non-Conventional Energy Sources, 5th Edition 2011, Khanna Publishers, New Delhi, India.

T2 Kreith, F and Kreider, J. F., Principles of Solar Engineering, McGraw-Hill, 1978.

BOS APPROVED REFERENCE BOOKS:

- R1** John Twidell&Tony Weir, Renewable Energy Resources – 2nd Edition, Taylor & Francis
- R2** G.N.Tiwari, Solar Energy – Fundamentals, Design, Modelling and Applications –Narosa Publication Ltd.,2000.
- R3** Ashok V Desai, Non-Conventional Energy- Wiley Eastern, 2000.

Part-B**COURSE DELIVERY PLAN (LESSON PLAN): Section-A****UNIT-I : GLOBAL AND NATIONAL ENERGY SCENARIO & SOLAR ENERGY HARNESSING DEVICES**

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.	Course Outcomes & Blooms Taxonomy Levels	1	26.12.2022		TLM1/ TLM2			
2.	Over view of conventional & renewable energy sources	1	28.12.2022		TLM1/ TLM2	CO1	T1	
3.	Need & Development of renewable energy sources	1	29.12.2022		TLM1/ TLM2	CO1	T1	
4.	Types of renewable energy systems.	1	30.12.2022		TLM1/ TLM2	CO1	T1	
5.	Energy available from Sun	1	02.01.2023		TLM1/ TLM2	CO1	T1	
6.	Solar radiation data,	1	04.01.2023					
7.	Flat plate and Concentrating collectors	1	05.01.2023		TLM1/ TLM2	CO1	T1	
8.	Mathematical analysis of Flat plate collectors	1	06.01.2023		TLM1/ TLM2	CO1	T1	
9.	collector efficiency	1	09.01.2023					
10.	Solar water Heating, Space Heating	1	11.01.2023		TLM1/ TLM2	CO1	T1	
11.	Active and Passive heating	1	12.01.2023					
12.	solar stills and ponds	1	18.01.2023		TLM1/ TLM2	CO1	T1	
13.	basic principle of power generation in photovoltaic cell	1	19.01.2023		TLM1/ TLM2	CO1	T1	
14.	Problems	1	20.01.2023		TLM1/ TLM2	CO1	T1	
15.	Quiz/Assignment							
No. of classes required to complete UNIT-I		14	No. of classes taken:					

UNIT-II : WIND ENERGY & GEOTHERMAL ENERGY

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
16.	Wind – characteristics – wind energy conversion systems	1	23.01.2023		TLM1/ TLM2	CO2	T1	
17.	Types of wind energy	1	25.01.2023					
18.	Betz model & Interference factor	1	27.01.2023		TLM1/ TLM2	CO2	T1	
19.	Power Coefficient Torque Coefficient and thrust coefficient	1	30.01.2023					
20.	site selection requirements.	1	01.02.2023		TLM1/ TLM2	CO2	T1	
21.	GEOTHERMAL ENERGY: Structure of Earth, Geothermal sources	1	02.02.2023		TLM1/ TLM2	CO2	T1	
22.	Hot springs, Hot Rocks& Hot Aquifers	1	03.02.2023		TLM1/ TLM2	CO2	T1	
23.	Interconnection of geothermal fossil systems	1	06.02.2023		TLM1/ TLM2	CO2	T1	
24.	Problems	1	08.02.2023		TLM1/ TLM2	CO1	T1	
25.	Quiz/Assignment							
No. of classes required to complete UNIT-II		9				No. of classes taken:		

UNIT-III : TIDAL ENERGY, WAVE ENERGY and OCEAN THERMAL ENERGY

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.	Tidal Energy- Introduction, Origin of Tides	1	09.02.2023		TLM1/ TLM2	CO3	T1, R8	
27.	Tidal Power generation	1	10.02.2023					
28.	Classification of Tidal Power Plant,	1	13.02.2023		TLM1/ TLM2	CO3	T1	
29.	Site requirements	1	15.02.2023		TLM1/ TLM2	CO3	T1	

					TLM2			
30.	WAVE ENERGY: Introduction, Wave energy and Power	1	16.02.2023		TLM1/ TLM2	CO3	T1	
31.	Wave Energy devices – Merits and Demerits	1	17.02.2023		TLM1/ TLM2	CO3	T1	
32.	OCEAN THERMAL ENERGY: Introduction	1	27.02.2023		TLM1/ TLM2	CO3	T1	
33.	Working principle of Ocean Thermal Energy Conversion	1	01.03.2023		TLM1/ TLM2	CO3	T1	
34.	OTEC Systems,	1	02.03.2023		TLM1/ TLM2	CO3	T1	
35.	Advantages and Disadvantages of OTEC plants.	1	03.03.2023					
36.	Quiz/Assignment					CO3		
No. of classes required to complete UNIT-III		10			No. of classes taken:			

UNIT-IV : BIO – ENERGY

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
37.	BIO – ENERGY: Introduction	1	06.03.2023		TLM1/ TLM2	CO4	T1	
38.	Biomass Energy Sources	1	09.03.2023		TLM1/ TLM2	CO4	T1	
39.	Aerobic and Anaerobic bio-conversion processes	1	10.03.2023		TLM1/ TLM2	CO4	T1	
40.	Types of Biogas plants	3	13.03.2023 15.03.2023 16.03.2023					
41.	Raw Materials and properties of Bio-gas	1	17.03.2023		TLM1/ TLM2	CO4	T1	
42.	Bio-gas plant Technology and Status	1	20.03.2023		TLM1/ TLM2	CO4	T1	
43.	Biomass gasification	2	23.03.2023 24.03.2023		TLM1/ TLM2	CO4	T1	
44.	Types and application of gasifier	1	27.03.2023		TLM1/ TLM2	CO4	T1	

45.	Quiz/Assignment					CO4		
No. of classes required to complete UNIT-IV		11			No. of classes taken:			

UNIT-V : DIRECT ENERGY CONVERSION SYSTEMS

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.	DIRECT ENERGY CONVERSION SYSTEMS: Introduction	2	29.03.2023 31.03.2023		TLM1/ TLM2	CO5	T1	
47.	Peltier effect, seebeck effect, Thomson effect,	1	03.04.2023		TLM1/ TLM2	CO5	T1	
48.	Fuel Cells-Types.	2	06.04.2023 10.04.2023		TLM1/ TLM2	CO5	T1	
49.	Efficiency of Fuel Cells.	1	12.04.2023		TLM1/ TLM2	CO5	T1	
50.	Thermoelectric power Generation	1	13.04.2023		TLM1/ TLM2	CO5	T1	
51.	Thermionic electro power Generation	1	17.04.2023					
52.	MHD Generator	1	19.04.2023		TLM1/ TLM2	CO5	T1	
53.	Open and closed systems	1	20.04.2023		TLM1/ TLM2	CO5	T1	
54.	applications of direct energy conversion systems	1	21.04.2023		TLM1/ TLM2	CO5	T1	
55.	Quiz/Assignment					CO5		
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

Academic Calender-A.Y-2020-21

Description	From	To	Weeks
B Tech V Semester			
Commencement of class work	26.12.2022		
I phase of Instructions	26.12.2022	18.02.2023	8
I Mid Examination	20.02.2023	25.02.2023	1
II phase of Instructions	27.02.2023	22.04.2023	8

II Mid Examination	24.04.2023	29.04.2023	1
Preparation and Practical	01.05.2023	06.05.2023	1
Semester End Examination	08.05.2023	20.05.2023	2
Internship	22.05.2023	01.07.2023	6

Part - C

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment 1	1	A1=5
Assignment 2	2	A2=5
I-Mid Examination	1,2,3	B1=15
Quiz – 1	1,2,3	Q1=10
Assignment 3	3	A3=5
Assignment 4	4	A4=5
Assignment 5	5	A5=5
II-Mid Examination	3,4,5	B2=15
Quiz – 2	3,4,5	Q2=10
Evaluation of Assignment: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max(B1,B2)+25% of Min(B1,B2)	1,2,3,4,5	B=15
Evaluation of Quiz Marks: $Q=75\%$ of Max(Q1,Q2)+25% of Min(Q1,Q2)	1,2,3,4,5	Q=10
Cumulative Internal Examination: A+B+Q	1,2,3,4,5	CIE=30
Semester End Examinations	1,2,3,4,5	SEE=70
Total Marks: CIE+SEE	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO1: To build a professional career and pursue higher studies with sound knowledge in Mathematics, Science and Mechanical Engineering.

PEO2: To inculcate strong ethical values and leadership qualities for graduates to become successful in multidisciplinary activities.

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

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to:

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

2. Problem analysis: Identify, formulate, review research literature, and 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.

PSOs

1. To apply the principles of thermal sciences to design and develop various thermal systems.

2. To apply the principles of manufacturing technology, scientific management towards improvement of quality and optimization of engineering systems in the design, analysis and manufacturability of products.

3. To apply the basic principles of mechanical engineering design or evaluation of performance of various systems relating to transmission of motion and power, conservation of energy and other process equipment.

Course Instructor	Course Coordinator	Module Coordinator	HOD
Kamala Priya B	Dr V Dhana Raju	Dr. P. Vijay Kumar	Dr. S. Pichi Reddy

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	: 2022-23
COURSE NAME & CODE	: Quantity Estimation & Project Management Lab (20CE62)
L-T-P STRUCTURE	: 0-0-3
COURSE CREDITS	: 1.5
COURSE INSTRUCTOR	: P. M. Ganga Raju, B. Ramakrishna
COURSE COORDINATOR	: P. M. Ganga Raju, B. Ramakrishna
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: 2022-23

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: 2022-23

LAB SCHEDULE

Sl.No	Name of the Experiment	Tentative Date	Actual Date
1	Quantity estimation of a single storey residential building (different items).	04-01-2023	
2	Cost estimation of a single storey residential building.	11-01-2023	
3	Quantity estimation of a B.T.Road (different items).	18-01-2023	
4	Cost estimation of a B.T.Road.	25-01-2023	
5	Quantity estimation of RCC roof slab and preparing schedule of bars.	01-02-2023	
6	Quantity estimation of RCC beam and preparing schedule of bars.	08-02-2023	
7	Quantity estimation of RCC Column with foundation and preparing schedule of bars.	15-02-2023	
8	Preparing the Project management report for a single storey residential building/Road/Canal by using the Bar Chart/Mile stone chart.	01-03-2023	
9	Preparing the Project management report for a single storey residential building by using the network technique (PERT/CPM).	15-03-2023	
10	Preparing the Project management report for a B.T.Road by using the network technique (PERT/CPM).	29-03-2023	
11	Revision	12-03-2023	
12	Revision	19-03-2023	

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	P. Mohanaganga Raju		B. Ramakrishna	Dr. V. Ramakrishna
Signature				



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

COURSE HANDOUT

PROGRAM	: B.Tech., VI-Sem., CIVIL
ACADEMIC YEAR	: 2022-23
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: P. KEERTHI

B.Tech (VI Sem)

B. NARASIMHA RAO

A.Y 2022-23

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. Bitumen content by centrifugal extractor

C-2-5. Specific gravity of bitumen

C-2-6. Viscosity test

C-2-7. Flash and fire point tests

INCHARGE

HOD

20CE63 – HIGHWAY ENGINEERING LAB

Course Instructor(s): P. KEERTHI

B.Tech (VI Sem)

B. NARASIMHA RAO

A.Y 2022-23

Batch-A

Tentative Date/Batch	Actual date	A1	A2	A3	A4	A5	A6
27.12.2022		Introduction	Introduction	Introduction	Introduction	Introduction	Introduction
03.01.2023		C-1-1	C-1-2	C-1-3	C-1-4	C-1-5	C-1-6
10.01.2023		C-1-2	C-1-3	C-1-4	C-1-5	C-1-6	C-1-1
24.01.2023		C-1-3	C-1-4	C-1-5	C-1-6	C-1-1	C-1-2
31.01.2023		C-1-4	C-1-5	C-1-6	C-1-1	C-1-2	C-1-3
07.02.2023		C-1-5	C-1-6	C-1-1	C-1-2	C-1-3	C-1-4
14.02.2023		C-1-6	C-1-1	C-1-2	C-1-3	C-1-4	C-1-5
28.02.2023		C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6
07.03.2023		C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-1
14.03.2023		C-2-3	C-2-4	C-2-5	C-2-6	C-2-1	C-2-2
21.03.2023		C-2-4	C-2-5	C-2-6	C-2-1	C-2-2	C-2-3
28.03.2023		C-2-5	C-2-6	C-2-1	C-2-2	C-2-3	C-2-4
04.04.2023		C-2-6	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5
11.04.2023		C-2-7	C-2-7	C-2-7	C-2-7	C-2-7	C-2-7
18.04.2023		REVISION					

20CE63 – HIGHWAY ENGINEERING LAB

Course Instructor(s): P. KEERTHI

B.Tech (VI Sem)

B. NARASIMHA RAO

A.Y 2022-23

Batch-B

Date/Batch	Actual date	B1	B2	B3	B4	B5	B6
29.12.2022		Introduction	Introduction	Introduction	Introduction	Introduction	Introduction
05.01.2023		C-1-1	C-1-2	C-1-3	C-1-4	C-1-5	C-1-6
12.01.2023		C-1-2	C-1-3	C-1-4	C-1-5	C-1-6	C-1-1
19.01.2022		C-1-3	C-1-4	C-1-5	C-1-6	C-1-1	C-1-2
02.02.2023		C-1-4	C-1-5	C-1-6	C-1-1	C-1-2	C-1-3
09.02.2023		C-1-5	C-1-6	C-1-1	C-1-2	C-1-3	C-1-4
16.02.2023		C-1-6	C-1-1	C-1-2	C-1-3	C-1-4	C-1-5
02.03.2023		C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6
09.03.2023		C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-1
16.03.2023		C-2-3	C-2-4	C-2-5	C-2-6	C-2-1	C-2-2
23.03.2023		C-2-4	C-2-5	C-2-6	C-2-1	C-2-2	C-2-3
06.04.2023		C-2-5	C-2-6	C-2-1	C-2-2	C-2-3	C-2-4
13.04.2023		C-2-6	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5
20.04.2023		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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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
(P. KEERTHI)

Course Coordinator
(P. KEERTHI)

Module Coordinator
(J RANGAIAH)

HOD
(Dr. V.
RAMAKRISHNA)



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

HIGHWAY ENGINEERING LAB

COURSE : B.TECH (VI SEM)

A.Y : 2022-23

LAB TIME TABLE

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

Batch-A : 20761A0101 to 20761A0136

Batch-B : 20761A0137 to 21765A0110

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 : 2022-23

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 of retaining walls and foundations using STAAD Pro
CO 3	Analyze, design and draw the details of RCC and steel structural elements.

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	A1	A2	A3	A4	A5	A6
27-12-2022	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
3-1-2023	1	1	1	1	1	1
10-1-2023	2	2	2	2	2	2
24-1-2023	3	3	3	3	3	3
31-1-2023	4	4	4	4	4	4
7-2-2023	5	5	5	5	5	5
14-2-2023	6	6	6	6	6	6

Date / Batch	B1	B2	B3	B4	B5	B6
29-12-2022	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
5-1-2023	1	1	1	1	1	1
12-1-2023	2	2	2	2	2	2
19-1-2023	3	3	3	3	3	3
2-2-2023	4	4	4	4	4	4
9-2-2023	5	5	5	5	5	5
16-2-2023	6	6	6	6	6	6

II CYCLE SCHEDULE

Date / Batch	A1	A2	A3	A4	A5	A6
28-2-2023	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
7-3-2023	7	7	7	7	7	7
14-3-2023	8	8	8	8	8	8
21-3-2023	9	9	9	9	9	9
28-3-2023	10	10	10	10	10	10
4-4-2023	11	11	11	11	11	11
11-4-2023	12	12	12	12	12	12

Date / Batch	B1	B2	B3	B4	B5	B6
2-3-2023	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
9-3-2023	7	7	7	7	7	7
16-3-2023	8	8	8	8	8	8
23-3-2023	9	9	9	9	9	9
30-3-2023	10	10	10	10	10	10
6-4-2023	11	11	11	11	11	11
17-4-2023	12	12	12	12	12	12

Batch A (20761A0137 to 21765A0110), **Tuesday**

Batch B (20761A0101 to 20761A0136), **Thursday**

PROGRAMME OUTCOMES (POs):

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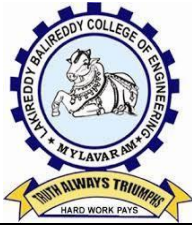
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L.B. REDDY NAGAR, MYLAVARAM, NTR DIST., A.P.-521 230.

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

Name of Course Instructor	: Dr. Sujith Kumar Rath & Mr. B Sagar	
Course Name & Code	: Soft skills & soft skills Laboratory (20HSS1)	
L-T-P Structure	: 0-0-1+2	Credit : 2
Program/Sem/Sec	: B.Tech, CIVIL, VI-Sem.,	A.Y: 2022-23

Course Description & Objectives:

The Soft Skills Laboratory course equips students with required behavioural, 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	Infer the self awareness and personality (Understand – L2)
CO2	Work effectively in multi-disciplinary and heterogeneous teams through the knowledge of team work, Inter-personal relationships, conflict management and leadership quality. (Apply – L3)
CO3	Communicate through verbal/oral communication and improve the listening skills (Apply – L3)
CO4	Relate the critical & lateral thinking while dealing with personal/social/professional issues. (Apply – L3)

Course Content:

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: News papers, pamphlets and news clippings)

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

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.

REFERENCE BOOKS:

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

CIVIL

S.No	No. of Lecture Hours	Date	Planned Topics	Actual Date	HOD Sign Weekly
1	1	30-12-22	Role of language in personality		
2	2	30-12-22	Extempore		
3	1	06-01-23	How language reflects, impacts Personality		
4	2	06-01-23	Story Telling		
5	1	20-01-23	Using gender-neutral language in MNCs		
6	2	20-01-23	Case Studies		
7	1	27-01-23	Being culturally-sensitive- Personality Traits- Grooming & Dress code		
8	2	27-01-23	Using authentic materials: News papers, pamphlets and news clippings		
9	1	03-02-23	Career Planning		
10	2	03-02-23	Public Speaking		
11	1	10-02-23	Job vs. career- goal setting		
12	2	10-02-23	Critical Appreciation and Textual Analysis		
13	1	17-02-23	SWOT analysis		
14	2	17-02-23	Writing a review on a given short story/videos/book		
15	1	03-03-23	Time management		
16	2	03-03-23	Empathetic speaking		
17	1	10-03-23	Self-management		
18	2	10-03-23	Telephonic conversation		
19	1	17-03-23	Stress-management		
20	2	17-03-23	Situation based dialogues		
21	1	24-03-23	Effective Resume-Writing and presentation		
22	2	24-03-23	Listening to dialogues and analyzing		
23	1	21-04-23	Interview Skills		
24	2	21-04-23	Mock Interviews		

Signature of Faculty

Signature of HOD