



# 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 Mohana Ganga Raju  
Course Name & Code : Estimation & Quantity Surveying-17CE28  
L-T-P Structure : 2-2-0 Credits : 3  
Program/Sem/Sec : B.Tech., CE., VII-Sem., Sections- A A.Y : 2021-2022

**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, 9<sup>th</sup> 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.	Introduction to Estimation & methods of Estimating	1	27-09-2021		TLM2	
2.	Main items of work, Units of Measurements	1	28-09-2021		TLM2	
3.	Different methods of Estimating	1	30-09-2021		TLM2	
4.	Deduction for openings, Degree of accuracy	1	04-10-2021		TLM2	
5.	Methods of building estimates, Individual wall method	1	05-10-2021		TLM2	
6.	Individual wall method problems	1	07-10-2021		TLM2	
7.	Centre line method procedure & problems	1	09-10-2021		TLM2	
8.	Arch masonry calculations	1	11-10-2021		TLM2	
9.	Estimate of steps	1	18-10-2021		TLM2	
10.	Estimate of a building from line plans	1	19-10-2021		TLM2	
No. of classes required to complete UNIT-I:10				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	21-10-2021		TLM2	
2.	Standard hooks & cranks in RCC	1	23-10-2021		TLM2	
3.	Estimate of RCC slab	1	25-10-2021		TLM2	
4.	Estimate of RCC Beam	1	26-10-2021		TLM2	
5.	Estimate of RCC T-Beam Slab	1	28-10-2021		TLM2	
6.	Estimate of RCC column with Foundation	1	30-10-2021		TLM2	
7.	Estimate of Pitching of slopes	1	01-11-2021		TLM2	
8.	Estimate of Earth work of road from longitudinal sections	1	02-11-2021		TLM2	
9.	Estimate of earth work in hill roads	1	06-11-2021		TLM2	
No. of classes required to complete UNIT-II:9				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.	Canal estimate-Earth work in canals different cases	1	15-11-2021		TLM2	
2.	Estimate of earth work in irrigation channels	1	16-11-2021		TLM2	
3.	Estimate of earth work in irrigation channels	1	18-11-2021		TLM2	
4.	Purpose and method of writing specifications	1	20-11-2021		TLM2	
5.	General specifications & Detailed	1	22-11-2021		TLM2	

	specifications for Brick work					
6.	Detailed specifications for RCC	1	23-11-2021			TLM2
7.	Detailed specifications for Plastering	1	25-11-2021			TLM2
8.	Detailed specifications for Mosaic flooring	1	27-11-2021			TLM2
9.	Detailed specifications for R.R Stone masonry	1	29-11-2021			TLM2
No. of classes required to complete UNIT-III: 9				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	30-11-2021			TLM2
2.	Preparing analysis of rates for Concrete & RCC works	1	02-12-2021			TLM2
3.	Preparing analysis of rates for Brick work in foundation & super structure	1	04-12-2021			TLM2
4.	Preparing analysis of rates for Plastering	1	06-12-2021			TLM2
5.	Preparing analysis of rates for CC flooring & White washing	1	07-12-2021			TLM2
6.	Organization of Engineering department; Work charged establishment	1	09-12-2021			TLM2
7.	Contract; Tender; Tender notice; Tender Schedule	1	11-12-2021			TLM2
8.	Earnest money; Security money; Measurement book	1	13-12-2021			TLM2
9.	Administrative approval; Technical sanction	1	14-12-2021			TLM2
10.	Plinth area; Floor Area; Carpet area	1	16-12-2021			TLM2
11.	Approximate Estimate; Plinth area estimate; Revised Estimate; Supplementary estimate	1	18-12-2021			TLM2
No. of classes required to complete UNIT-IV: 11				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	20-12-2021			TLM2
2.	Outgoings, depreciation	1	21-12-2021			TLM2
3.	Methods for estimating cost depreciation	1	23-12-2021			TLM2
4.	Valuation of building & Gross income, Net income, Scrap value	1	27-12-2021			TLM2
5.	Salvage value, Obsolescence & Life of structures, sinking fund	1	28-12-2021			TLM2

6.	Capitalized value, Years purchase, Standard rent	1	30-12-2021		<b>TLM2</b>
7.	Process of fixing standard rent, Annuity & Mortgage	1	01-01-2022		<b>TLM2</b>
No. of classes required to complete UNIT-V: 7				No. of classes taken:	

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

### **PART-C**

#### **EVALUATION PROCESS (R17 Regulations):**

<b>Evaluation Task</b>	<b>Marks</b>
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	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=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
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=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

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

Course Instructor  
(P. Mohanaganga Raju)

Module Coordinator  
(B. Ramakrishna)

HOD  
(Dr. V. Ramakrishna)

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

**COURSE HANDOUT**

<b>PROGRAM</b>	: B.Tech., VII-Sem., CIVIL
<b>ACADEMIC YEAR</b>	: 2021-22
<b>COURSE NAME &amp; CODE</b>	: R S AND GIS APPLICATIONS (17CE29)
<b>L-T-P STRUCTURE</b>	: 2-2-0
<b>COURSE CREDITS</b>	: 3
<b>COURSE INSTRUCTOR</b>	: J.Rangaiah
<b>COURSE COORDINATOR</b>	: J.Rangaiah
<b>PRE-REQUISITE</b>	: Nil

**Course Educational Objective:**

The course is designed to understand the techniques of Remote Sensing and GIS Technology for civil engineering applications.

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

- CO1: Interpret the concepts of Photogrammetry and its applications such as determination of heights of objects on terrain.
- CO2: Illustrate the Electromagnetic spectrum and utilize the energy interactions of EMR with atmosphere and earth surface features for GIS data generation.
- CO3: Analyze the methods of map projections and understand coordinate systems on GIS Software packages to produce high resolution thematic maps.
- CO4: Apply the concepts of vector and raster data model for representation of topological earth features and its importance.
- CO5: Apply the RS & GIS techniques for solving civil engineering applications

**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	1	1	1	2	2		1			2		2		1
CO2	2	1	1	1	2	2		1			2		2		1
CO3	2	2	1	2	2	2		1			2		2		1
CO4	2	2	1	2	2	2		1			2		2		1
CO5	2	3	1	3	2	3		1			2		2		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** S S Manugula, “Photogrammetry, GIS & Remote Sensing” Ebooks2go Inc, 2018.
- T2** Kang – Tsung Chang, “Introduction to geographic information system”, Tata McGraw-Hill Education Private Limited, 2007.

**BOS APPROVED REFERENCE BOOKS:**

- R1** Sujit Choudhury, Deepankar Chakrabarti, Suchandra Choudhury, “An Introduction to Geographic Information Technology” I.K. International Publishing House Pvt. Ltd. 2009.
- R2** Shivangi Somvanshi, Maya Kumari, “A Introduction to Remote Sensing and Its Applications”, S.K. Kataria & Sons 2014.
- R3** Basudeb Bhatta, “Remote sensing and GIS” Oxford University press, 2011.
- R4** S. Kumar, “Basics of Remote sensing and GIS”, Laxmi Publications, 2016.
- R5** K Elangovan, “GIS Fundamentals, Applications and Implementations” New India Publishing Agency, 2006.
- R6** Remote sensing and Geographical Information Technology, NPTEL video lectures and web notes

**COURSE DELIVERY PLAN (LESSON PLAN): Civil****UNIT-I: INTRODUCTION TO PHOTOGRAMMETRY**

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.	Principle and types of aerial photograph	1	27/09/2021		TLM-2	CO1	T1	
2.	Geometry of vertical aerial photograph	1	28/09/2021		TLM-2	CO1	T1	
3.	Scale and height measurement on single vertical aerial photograph	1	30/09/2021		TLM-2	CO1	T1	
4.	Height measurement based on relief displacement	1	04/10/2021		TLM-2	CO1	T1	
5.	Tutorial-1	1	05/10/2021		TLM-3	CO1	T1	
6.	Fundamentals of stereoscopy	1	07/10/2021		TLM-2	CO1	T1	
7.	Fudicial points, parallax	1	09/10/2021		TLM-2	CO1	T1	
8.	Measurements using fudicial points.	1	11/10/2021		TLM-2	CO1	T1	
9.	Tutorial-2	1	12/10/2021		TLM-3	CO1	T1	
No. of classes required to complete UNIT-II		9			No. of classes taken:			

**UNIT-II: REMOTE SENSING**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Basic concept of remote sensing	1	18/10/2021		TLM-2	CO2	R2	
2.	Remote sensing data collection	1	21/10/2021		TLM-2	CO2	R2	
3.	Remote sensing advantages and limitations	1	23/10/2021		TLM-2	CO2	R2	
4.	Remote sensing	1	25/10/2021		TLM-2	CO2	R2	

	process, Electromagnetic spectrum							
5.	Energy interactions with atmosphere and with earth surface features (soil, water, vegetation)	1	26/10/2021		TLM-2	CO2	R2	
6.	Indian satellites and sensors characteristics	1	28/10/2021		TLM-2	CO2	R2	
7.	Tutorial-3	1	30/10/2021		TLM-3	CO2	R2	
8.	Resolution, map and image and false color composite	1	01/11/2021		TLM-2	CO2	R2	
9.	Introduction to digital data, elements of visual interpretation techniques.	1	02/11/2021		TLM-2	CO2	R2	
10.	Tutorial-4	1	06/11/2020		TLM-3			
No. of classes required to complete UNIT-II		10			No. of classes taken:			

### UNIT-III: GEOGRAPHIC INFORMATION SYSTEM

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to GIS, Components of a GIS	1	15/11/2021		TLM-2	CO3	R2	
2.	Geospatial data: Spatial data, attribute data, joining spatial and attribute data	1	16/11/2021		TLM-2	CO3	R2	
3.	GIS operations: Spatial data input, attribute data management	1	18/11/2021		TLM-2	CO3	R2	
4.	Data display, data exploration, data analysis.	1	20/11/2021		TLM-2	CO3	R2	
5.	Tutorial-5	1	22/11/2021		TLM-3	CO3	R2	
6.	Geographic coordinate system: Approximation of the earth, datum.	1	23/11/2021		TLM-2	CO3	R2	
7.	Types of map projections Map projection parameters, commonly used map projections.	1	25/11/2021		TLM-2	CO3	R2	
8.	Projected coordinate systems.	1	27/11/2021		TLM-2	CO3	R2	



9.	Tutorial-6	1	29/11/2021		TLM-3	CO3	R2	
No. of classes required to complete UNIT-III		9			No. of classes taken:			

#### UNIT-IV: VECTOR AND RASTER DATA MODEL

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.	Vector Data Model: Representation of simple features,	1	30/11/2021		TLM-2	CO4	T1	
2.	Topology and its importance Coverage and its data structure, Shape file;	1	02/12/2021		TLM-2	CO4	T1	
3.	Geometric representation of spatial feature and data structure, topology rules.	1	04/12/2021		TLM-1	CO4	T1	
4.	Tutorial-7	1	06/12/2021		TLM-3	CO4	T1	
5.	Raster Data Model: Elements of the raster data model, types of raster data, raster data structure	1	07/12/2021		TLM-2	CO4	T1	
6.	Data conversion, integration of raster and vector data.	1	09/12/2021		TLM-2	CO4	T1	
7.	Data Input: Metadata, conversion of existing data, Creating new data	1	11/12/2021		TLM-2	CO4	T1	
8.	Digitizing, scanning, on screen digitizing, importance of source map, data editing.	1	13/12/2021		TLM-2	CO4	T1	
9.	Tutorial-8	1	14/12/2021		TLM-3	CO4	T1	
No. of classes required to complete UNIT-IV		9			No. of classes taken:			

#### UNIT-V: CIVIL ENGINEERING APPLICATIONS

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.	Surface water mapping and inventory, Rainfall runoff relations	1	16/12/2021		TLM-1	CO5	T1	
2.	Watershed management for sustainable development	1	18/12/2021		TLM-2	CO5	T1	
3.	Reservoir sedimentation	1	20/12/2021		TLM-2	CO5	T1	
4.	Tutorial-9	1	21/12/2021		TLM-3	CO5	T1	
5.	Ground water targeting, and identification for groundwater recharge	1	23/12/2021		TLM-2	CO5	T1	
6.	Waste management facilities	1	27/12/2021		TLM-2	CO5	T1	
7.	Water Quality Modeling and Mapping	1	28/12/2021		TLM-2	CO5	T1	
8.	Tutorial-10	1	03/01/2022		TLM-3	CO5	T1	
No. of classes required to complete UNIT-V		9			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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.								
2.								
3.								

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	

### ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	27-09-2021	06-11-2021	6 W
I Mid Examinations	08-11-2021	13-11-2021	1 W
II Phase of Instructions	15-11-2021	01-01-2022	7 W
II Mid Examinations	03-01-2022	08-01-2022	1 W

Preparation and Practicals	10-01-2022	15-01-2022	1 W
Semester End Examinations	17-01-2022	29-01-2022	2 W

### EVALUATION PROCESS (R17 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	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=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
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=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.

<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):**

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

**Course Instructor**

**Course Coordinator**

**Module Coordinator**

**HOD**



# LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (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

### Part-A

**PROGRAM** : B.Tech,VII-SEM, Civil  
**ACADEMIC YEAR** : 2021-22  
**COURSE NAME & CODE** : Design of Reinforced Concrete Structures-II17CE30  
**L-T-P STRUCTURE** : 2-2-0  
**COURSE CREDITS** : 3  
**COURSE INSTRUCTOR** : B Rama krishna

**PRE-REQUISITES:** Applied Mechanics, Strength of Materials, Structural Analysis, Concrete technology, DRCS-1

**COURSE EDUCATIONAL OBJECTIVE:** This course deals with design of shallow and deep foundations, different types of slabs along with staircase and retaining walls

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

- CO1: Design the footings
- CO2: Design the piles.
- CO3: Design different slabs.
- CO4: Design the staircases
- CO5: Design cantilever type retaining walls

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	2	3		1	1					2		3	1	1
CO2	2	2	3		1	1					2		3	1	1
CO3	2	2	3		1	1					2		3	1	1
CO4	2	2	3		1	1					2		3	1	1
CO5	2	2	3		1	1					2		3	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** B.C. Punmia, Ashok Kumar Jain, Arun Kumar Jain “Comprehensive RCC Design”, Laxmi Publications (P) Ltd, New Delhi, 2015.
- T2** N. Krishnaraju, “Advanced Reinforced Concrete design”, CBS Publishers & Distributors, New Delhi, 2005

### **BOS APPROVED REFERENCE BOOKS:**

- R1** P.C. Varghese, “Limit State Design of Reinforced Concrete”, Prentice Hall of India Pvt., Ltd., New Delhi, 2008.
- R2** P.C. Varghese, “Advanced Reinforced Concrete Design”, Prentice Hall of India Pvt., Ltd., New Delhi, 2002.

**Part-B**

**COURSE DELIVERY PLAN (LESSON PLAN):**

**UNIT- I: DESIGN OF SHALLOW FOUNDATIONS**

<b>S.No.</b>	<b>Topics to be covered</b>	<b>No. of Classes Required</b>	<b>Tentative Date of Completion</b>	<b>Actual Date of Completion</b>	<b>Teaching Learning Methods</b>	<b>Learning Outcome COs</b>	<b>Text Book followed</b>	<b>HOD Sign Weekly</b>	
1.	Introduction and types of foundations	1	27-09-2021		2	CO 1	T1		
2.	IS456-2000 Design specifications	1	28-09-2021		2	CO 1	T1		
3.	Analysis of rectangular isolated footing of uniform thickness	1	30-09-2021		2	CO 1	T1		
4.	Analysis of square isolated footing of uniform thickness and design procedure	1	04-10-2021		2	CO 1	T1		
5.	Design of rectangular isolated footing of uniform thickness	1	05-10-2021		2	CO 1	T1		
6.	Design of square isolated footing of uniform thickness	1	07-10-2021		2	CO 1	T1		
7.	Analysis of rectangular and square isolated sloped footings	1	09-10-2021		2	CO 1	T1		
8.	Design problems	1	11-10-2021		2	CO 1	T1		
9.	<b>Tutorial-1</b>	1	12-10-2021		3	CO 1			
No. of classes required to complete UNIT-I		8			No. of classes taken:				

**UNIT-II: DESIGN OF PILE FOUNDATIONS**

S.No	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction	1	18-10-2021		2	CO 2	T1	
2.	Types of piles and grouping	1	21-10-2021		2	CO 2	T1	
3.	IS code provisions	1	23-10-2021		2	CO 2	T1	
4.	Design procedure for pile foundation	1	25-10-2021		2	CO2	T1	
5.	Design problems	1	26-10-2021		2	CO 2	T1	
6.	Design procedure for pile cap	1	28-10-2021		2	CO 2	T1	
7.	Design problems	1	30-10-2021		2	CO 2	T1	
8.	<b>Tutorial-2</b>	1	01-11-2021		3	CO 2	T1	
No. of classes required to complete UNIT-II		07			No. of classes taken:			

**UNIT-III : DESIGN OF SLABS**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction and yield line theory	1	02-11-2021		2	CO 3	T1	
2.	Yield lines for different boundary conditions	1	06-11-2021		2	CO 3	T1	
3.	<b>Mid-1</b>	<b>08-11-2021 to 15-11-2021</b>						
4.	Design of circular slabs	1	16-11-2021		2	CO 3	T1	
5.	Design problems	1	18-11-2021		2	CO 3	T1	
6.	Design problems	1	20-11-2021		2	CO 3	T1	
7.	Design problems	1	22-11-2021		2	CO 3	T1	
8.	Design of grid slab	1	23-11-2021		2	CO 3	T1	
9.	Design problems	1	25-11-2021		2	CO 3	T1	
10.	Design problems	1	27-11-2021		2	CO 3	T1	
11.	Design of flat slabs	1	29-11-2021		2	CO3	T1	
12.	Design problems	1	30-11-2021		2	CO3	T1	
13.	<b>Tutorial-3</b>	1	02-12-2021		3	CO3		
No. of classes required to complete UNIT-III		11			No. of classes taken:			

**UNIT-IV: DESIGN STAIRS**

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.	Types of stair cases	1	04-12-2021		2	CO 4	T1	
2.	IS Specification for staircases and design procedure	1	06-12-2021		2	CO 4	T1	
3.	Design of stairs spanning horizontally	1	07-12-2021		2	CO 4	T1	
4.	Design of dog legged stair	1	09-12-2021		2	CO 4	T1	
5.	Design problems	1	11-12-2021		2	CO 4	T1	
6.	Design problems	1	13-12-2021		2	CO 4	T1	
7.	<b>Tutorial-4</b>	1	14-12-2021		3	CO 4	T1	
No. of classes required to complete UNIT-IV		06			No. of classes taken:			

**UNIT-V: DESIGN OF CANTILEVER RETAINING WALLS**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to retaining walls and types of retaining walls	1	16-12-2021		2	CO 5	T1	
2.	Forces acting on retaining walls	1	18-12-2021		2	CO 5	T1	
3.	Stability requirements and design procedures	1	20-12-2021		2	CO 5	T1	
4.	Design of cantilever type retaining wall	1	21-12-2021		2	CO 5	T1	



5.	Design of cantilever type retaining wall	1	23-12-2021		2	CO5	T1	
6.	Design problems	1	27-12-2021		2	CO5	T1	
7.	Design problems	1	28-12-2021		2	CO5	T1	
8.	<b>Tutorial-5</b>	1	30-12-2021		3	CO5	T1	
9.	<b>Mid-2</b>	03-01-2022 to 08-01-2022						
No. of classes required to complete UNIT-V		07			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	Learning Outcome COs	Text Book followed	HOD Sign
10.								

### Teaching Learning Methods

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

### ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	27-09-2021	06-11-2021	6W
I Mid Examinations	08-11-2021	13-11-2021	1W
II Phase of Instructions	15-11-2021	01-01-2022	7W
II Mid Examinations	03-01-2022	08-01-2022	1W
Preparation and Practicals	10-01-2022	15-01-2022	1W
Semester End Examinations	17-01-2022	29-01-2022	2W

## Part – C

### EVALUATION PROCESS:

<b>Evaluation Task</b>	<b>COs</b>	<b>Marks</b>
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
Quiz -1	1,2	C1=10
Assignment/Quiz – 3	3	A3=5
Assignment/Quiz – 4	4	A4=5
Assignment/Quiz – 5	5	A5=5
II-Mid Examination	3,4,5	B2=20
Quiz -2	1,2	C2=10
Evaluation of Assignment/Quiz Marks: $A=(A1+A2+A3+A4+A5)/5$	1,2,3,4,5	A=5
Evaluation of Mid Marks: $B=75\%$ of Max (B1, B2) +25% of Min (B1,	1,2,3,4,5	B=20
Evaluation of Quiz Marks: $C=75\%$ of Max(C1,C2)+25% of Min(C1,C2)	1,2,3,4,5	C=10
Attendance Marks: D ( $>95\%=5$ , $90-95\%=4$ , $85-90\%=3$ , $80-85\%=2$ , $75-80\%=1$ )		D=5
<b>Cumulative Internal Examination: A+B+C+D</b>	<b>1,2,3,4,5</b>	<b>40</b>
<b>Semester End Examinations</b>	<b>1,2,3,4,5</b>	<b>E=60</b>
<b>Total Marks: A+B+C+D+E</b>	<b>1,2,3,4,5</b>	<b>100</b>

### PROGRAM EDUCATIONAL OBJECTIVES:

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.
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.
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.

## PROGRAM OUTCOMES (PO'S)

At the end of the programme, the students will possess-

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.

### PSO's

**PSO1:** Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering

**PSO2:** Possesses ability to plan, examine and analyze the various laboratory tests required for the professional demands

**PSO3:** Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Course Instructor	Module Coordinator	HOD



# 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

Name of Course Instructor : C.Rajamallu  
 Course Name & Code : Prestressed concretes(17CE31)  
 L-T-P Structure : 3-1-0 Credits : 3  
 Program/Sem/Sec : B.Tech.,CE.,VII-Sem., Sections- A A.Y : 2021-2022

### COURSE DELIVERY PLAN (LESSON PLAN)

#### UNIT-I: Basic concepts of prestressing

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 prestressed	1	28.09.2021	28.09.2021	TLM2	
2.	Historic development of prestressed	1	29.09.2021	29.09.2021	TLM2	
3.	General principles of prestressing	1	01.10.2021	01.10.2021	TLM2	
4.	Principles of pre tensioning and post tensioning	1	05.10.2021	05.10.2021	TLM2	
5.	Advantages of prestressed concrete	1	05.10.2021	05.10.2021	TLM2	
6.	Limitations of prestressed concrete	1	06.10.2021	06.10.2021	TLM2	
7.	Materials of prestressed concrete	1	08.10.2021	08.10.2021	TLM2	
8.	High strength concrete and High tensile steel	1	08.10.2021	08.10.2021	TLM2	
9.	Relaxation of stress, stress corrosion	1	09.10.2021	19.10.2021	TLM2	
10.	Durability, fire resistance, cover requirement	1	12.10.2021	12.10.2021	TLM2	
11.	<b>Tutorial-1</b>	1	12.10.2021	12.10.2021	TLM3	
No. of classes required to complete UNIT-I:11				No. of classes taken:11		

#### UNIT-II: Prestressing systems

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 and Methods of prestressing	1	19.10.2021	19.10.2021	TLM2	
2.	Pre-tensioning method and post tensioning methods	1	22.10.2021	22.10.2021	TLM2	
3.	Post tensioning methods analysis	1	23.10.2021	23.10.2021	TLM2	
4.	Different systems of prestressing	1	26.10.2021	26.10.2021	TLM2	
5.	Hoyer's , Magnel analysis	1	26.10.2021	26.10.2021	TLM2	
6.	Freyssinet and Gifford analysis	1	27.10.2021	27.10.2021	TLM2	

7.	Basic assumptions in analysis Prestress and design	1	27.10.2021	27.10.2021	TLM2	
8.	Resultant stress at a section	1	29.10.2021	29.10.2021	TLM2	
9.	Pressure line, concept of load balancing	1	30.10.2021	30.10.2021	TLM2	
10.	Stress in tendons, cracking moment	1	02.11.2021	02.11.2021	TLM2	
11.	Tutorial -2	2	03.11.2021	03.11.2021	TLM 3	
No. of classes required to complete UNIT-II:12				No. of classes taken:12		

### UNIT-III: Losses of prestressing

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 losses of prestress	1	05.11.2021	05.11.2021	TLM2	
2.	Analysis of sections of flexure	1	05.11.2021	05.11.2021	TLM2	
3.	Elastic analysis of concrete beams prestressed with tendons	1	06.11.2021	06.11.2021	TLM2	
4.	Problems on various elastic tendons	1	09.11.2021	09.11.2021	TLM2	
5.	Elastic shortage of concrete	1	10.11.2021	10.11.2021	TLM2	
6.	Problems on elastic shortage concrete	1	12.11.2021	12.11.2021	TLM2	
7.	Problems on elastic shortage concrete	1	12.11.2021	12.11.2021	TLM2	
8.	Tutorial -3	1	13.11.2021	13.11.2021	TLM2	
9.	Shrinkage of concrete ,Problems on shrinkage of concrete	1	16.11.2021	16.11.2021	TLM2	
10.	Creep of concrete, Relaxation of steel	1	17.11.2021	17.11.2021	TLM2	
11.	Problems on both the cases	1	19.11.2021	19.11.2021	TLM2	
12.	Frictional losses and problems	1	20.11.2021	20.11.2021	TLM2	
13.	Tutorial -4	1	23.11.2021	23.11.2021	TLM3	
14.	Problems on Anchorage slip	1	24.11.2021	24.12.2021	TLM2	
15.	Total loss of pretensioning & Post tensioning	1	24.11.2021	24.12.2021	TLM2	
16.	Losses problems	1	26.11.2021		TLM2	
No. of classes required to complete UNIT-III:16				No. of classes taken:16		

### UNIT-IV :Design for flexural resistance

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of flexural failures	1	27.11.2021		TLM2	
2.	Problems on flexural failure	1	27.11.2021		TLM2	
3.	Flexural failure, Strain compatibility method	1	30.11.2021		TLM2	

4.	Tutorial -5	2	01.12.2021		TLM2	
5.	Problems on strain compatibility	1	03.12.2021		TLM2	
6.	Problems	1	04.12.2021		TLM2	
7.	Control of deflections, factors influencing	1	07.12.2021		TLM3	
8.	Prediction of short term deflection	1	08.12.2021		TLM2	
9.	Prediction of long term deflection	1	08.12.2021		TLM2	
10.	Tutorial-6	2	10.12.2021		TLM3	
No. of classes required to complete UNIT-IV:12				No. of classes taken:		

#### UNIT-V :Design for Shear and Torsion

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Shear and principles of stresses	1	11.12.2021		TLM2	
2.	Problems on flexibility matrix method	1	14.12.2021		TLM2	
3.	Principal of stresses	1	14.12.2021		TLM2	
4.	Problems in principal of stress and shear	1	15.12.2021		TLM2	
5.	Design of shear reinforcement	1	15.12.2021		TLM2	
6.	Design for torsion,	1	17.12.2021		TLM2	
7.	Design for combined bending, Shear and Torsion	1	18.12.2021		TLM2	
8.	Revision & <b>TUTORIAL-7</b>	2	21.12.2021		TLM3	
9.	Transfer of Prestress in pre tensioned members	1	22.12.2021		TLM2	
10.	Transmission length, bond stress, end zone reinforcement	1	24.12.2021		TLM2	
11.	Mugnel method, Problems, Anchorage zone stresses	1	24.12.2021		TLM2	
12.	Anchorage zone reinforcement problems, Analysis of stresses	1	28.12.2021		TLM2	
13.	Differential shrinkage and problems	1	29.12.2021		TLM2	
14.	<b>TUTORIAL-8</b>	2	31.12.2021		TLM3	
No. of classes required to complete UNIT-V:16				No. of classes taken:		

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

Course Instructor  
C.Rajamallu

Course Coordinator  
C.Rajamallu

Module Coordinator  
B.Ramakrishna

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

## DEPARTMENT OF CIVIL ENGINEERING

### COURSE HANDOUT

#### PART-A

Name of Course Instructor : Annapareddy V N Reddy  
Course Name & Code : Introduction to Database & 17IT80  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech, CIVIL. VII-Sem. A.Y : 2021-22

**PREREQUISITE:** Elementary set theory, concepts of relations and functions, propositional logic data structures (trees, Graphs, dictionaries) & File Concepts.

**COURSE EDUCATIONAL OBJECTIVES (CEOs):** This course enables the students to know about DBMS basic concepts, Database Languages, Database Design, Normalization process and Transaction processing and Indexing.

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

<b>CO 1</b>	<b>Understand</b> DBMS concepts, architecture(L2)
<b>CO 2</b>	<b>Design</b> Entity Relational Models and make them into data models.(L3)
<b>CO 3</b>	<b>Understand</b> the usage of keys and constraints for relational data.(L2)
<b>CO 4</b>	<b>Apply</b> the normalization process for database design.(L3)
<b>CO 5</b>	<b>Analyze</b> the issues in transaction processing and different recovery strategies.(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
<b>CO1</b>	1	1	2	-	-	-	-	-	-	-	-	-	3	2	2
<b>CO2</b>	3	3	-	-	-	-	-	-	-	-	-	-	2	3	2
<b>CO3</b>	3	2	-	-	-	-	-	-	-	-	-	-	2	3	2
<b>CO4</b>	2	1	2	-	-	-	-	-	-	-	-	-	3	2	3
<b>CO4</b>	2	1	2	-	-	-	-	-	-	-	-	-	2	3	3

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

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

**TEXT BOOKS:**

<b>T1</b>	Henry F. Korth, Abraham Silberschatz, S. Sudarshan, "Database Concepts", McGraw Hill, 6th edition, 2009.
<b>T2</b>	RamezElmasri, Shamkanth B. Navathe, "Fundamentals Of Database Systems", Addison Wesley, 6th edition, 2010.

**REFERENCE BOOKS:**

<b>R1</b>	Raghu Ramakrishna, Johannes Gehrke, "Database Management System", McGraw Hill 3rd edition, 2000.
<b>R2</b>	Date C. J, "An Introduction to Database System", Pearson Education, 8th edition, 2003.
<b>R3</b>	Shara Maheshwari, Ruchi Jain, "DBMS: Complete Practical Approach", Firewall Media, New Delhi, 2005.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT-I: Introduction**

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Course and COs	1	27.09.2021		TLM2	
2.	Introduction, An overview of database management system, Database system Vs file system	1	28.09.2021		TLM2	
3.	Database system concepts and architecture, Data models schema and instances	1	30.09.2021		TLM2	
4.	Data independence and database language and interfaces	1	01.10.2021		TLM2	
5.	Data definitions language, DML, Overall Database Structure	1	04.10.2021		TLM2	
6.	<b>Revision on Unit-1 &amp; Assignment-I</b>	1	05.10.2021		TLM2	
No. of classes required to complete UNIT-I: 06				No. of classes taken:		

**UNIT-II: Data Modeling using the Entity Relationship Model**

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.	ER model concepts - attributes, entity, Relationships	2	07.10.2021, 08.10.2021		TLM2	
2.	notation for ER diagram, Mapping constraints	1	18.10.2021 19.10.2021		TLM2	
3.	Relationships of higher degree, keys -Concepts of Super Key, and identity key, primary key	1	21.10.2021 22.10.2021		TLM2	
4.	Generalization, Aggregation	1	25.10.2021 26.10.2021		TLM2	
5.	Reduction of ER diagrams to tables	1	28.10.2021 29.10.2021		TLM2	
6.	<b>Revision on Unit - II &amp; Assignment-II</b>	1	01.11.2021, 02.11.2021 05.11.2021		TLM2	
No. of classes required to complete UNIT-II: 13				No. of classes taken:		
<b>I MID EXAMINATIONS</b>				<b>08/11/2021 TO 13/11/2021</b>		



**UNIT-III: Relational Data Model and Language**

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.	Relational data model concepts	1	15.11.2021		TLM2	
2.	Integrity constraints: entity integrity, referential integrity, Keys constraints, Domain constraints	1	16.11.2021		TLM2	
3.	Relational algebra	1	18.11.2021		TLM2	
4.	Characteristics of SQL, Advantage of SQL SQL data types and literals, Types of SQL commands SQL operators and their procedure	1	19.11.2021		TLM2	
5.	Tables, views and indexes, Queries and subqueries, Aggregate functions Insert, update and delete operations	1	22.11.2021		TLM2	
6.	Unions, Intersection, Minus, Cursors in SQL	1	23.11.2021		TLM2	
7.	<b>Revision of UNIT-3 &amp; Assignment-III</b>	1	25.11.2021 26.11.2021		TLM2	
No. of classes required to complete UNIT-III: 08				No. of classes taken:		

**UNIT-IV: Normalization**

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.	Functional Dependencies	1	29.11.2021		TLM2	
2.	Normal Forms: First, Second, Third Normal Forms	1	30.11.2021		TLM2	
3.	BCNF, Inclusion Dependencies Lossless Join Decompositions	1	02.12.2021		TLM2	
4.	Normalization Using FD,MVD Normalization Using JD	1	03.12.2021		TLM2	
5.	Normalization Using FD,MVD Normalization Using JD	1	06.12.2021		TLM2	
6.	Alternative Approaches to Database Design	1	17.12.2021		TLM2	
7.	Revision of Unit-4 & Assignment-IV	1	09.12.2021 10.12.2021		TLM2	
No. of classes required to complete UNIT-IV: 8				No. of classes taken:		

**UNIT-V: Transaction Processing Concepts**

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.	Transaction System, Testing Of Serializability , Serializability of Schedules	1	13.12.2021		TLM2	
2.	Conflict & View Serializable Schedule, Recoverability, Log Based Recovery, Checkpoints	1	14.12.2021		TLM2	
3.	ARIES Algorithm, Deadlock Handling	1	16.12.2021 17.12.2021		TLM2	
4.	Concurrency Control Techniques For Concurrency Control	1	20.12.2021 21.12.2021		TLM2	
5.	Time Stamping Protocols for Concurrency Control	1	23.12.2021 24.12.2021		TLM2	
6.	Locking, Validation Based Protocol, Multiple Granularity, Recovery With Concurrent Transactions	1	27.12.2021 28.12.2021		TLM2	
7.	<b>Revision of UNIT-5 &amp; Assignment-V</b>	1	30.12.2021		TLM2	
No. of classes required to complete UNIT-V: 11				No. of classes taken:		

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

**PART-C****EVALUATION PROCESS (R17 Regulations):**

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	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=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
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=20
Quiz Marks =75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60

Total Marks = CIE + SEE	100
-------------------------	-----

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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
<b>PO 6</b>	<b>The engineer and society:</b> 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
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

<b>PSO 1</b>	<b>Communication:</b> Design and develop modern communication technologies for building the inter disciplinary skills to meet current and future needs of industry.
<b>PSO 2</b>	<b>VLSI and Embedded Systems:</b> Design and Analyze Analog and Digital Electronic Circuits or systems and Implement real time applications in the field of VLSI and Embedded Systems using relevant tools
<b>PSO 3</b>	<b>Signal Processing:</b> Apply the Signal processing techniques to synthesize and realize the issues related to real time applications

Course Instructor	Course Coordinator	Module Coordinator	HOD
Mr.Annapareddy V N Reddy	Mr.Michael Sadgun Rao Kona	Dr .S. Naganjaneyulu	Dr.B.Srinivasa Rao



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING**  
**DEPARTMENT OF CIVIL ENGINEERING**  
(Autonomous & Affiliated to JNTUK, Kakinada & Approved by AICTE, New Delhi,  
Accredited by NAAC, Certified by ISO 9001:2015  
L B Reddy Nagar, Mylavaram-521 230, Krishna District, Andhra Pradesh.

## COURSE HANDOUT

**PROGRAM** : B.Tech., VII-Sem., CE  
**ACADEMIC YEAR** : 2021-22  
**COURSE NAME & CODE** : Environmental Engineering -17CE35  
**L-T-P STRUCTURE** : 3-1-0  
**COURSE CREDITS** : 3  
**COURSE INSTRUCTOR** : Dr V. Ramakrishna  
**COURSE COORDINATOR** : Dr V. Ramakrishna  
**PRE-REQUISITE** : Nil

### Course Objectives:

This course deals with importance of meteorology on air pollution and dispersion of air pollutants, air pollution control techniques, impacts of noise pollution on society, study of the principles of noise pollution, solid waste management in the society, impacts of hazardous waste flow in society and application of environmental management principles to develop solutions to major environmental problems.

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

- CO1:** Evaluate the impacts of air pollution due to meteorology and estimate concentration of pollutants at any location using available air quality models.
- CO2:** Design the air pollution control equipment
- CO3:** Apply appropriate measures to estimate and reduce noise pollution
- CO4:** Apply appropriate techniques for the management of solid waste in the society
- CO5:** Analyze the impacts of hazardous waste flow in society and apply the principles of environmental management to develop solutions to major environmental problems

### 4. Course Articulation Matrix:

Course Code	COs	Programme Outcomes												PSOs		
		1	2	3	4	5	6	7	8	9	10	11	12	1	2	3
17CE 35	CO1	2	2	2	3	1							1	2	2	2
	CO2	2	2	3	2	1							1	2	2	3
	CO3	2	2	3	2	1							1	2	2	2
	CO4	2	2	3	2	1							1	2	2	3
	CO5	2	2	1	1	2	1						1	1	1	1
<b>1 = Slight (Low)</b>		<b>2 = Moderate (Medium)</b>						<b>3-Substantial (High)</b>								

### BOS APPROVED TEXT BOOKS:

- T1** Garg.S.K, "Sewage disposal and Air Pollution Engineering", Khanna Publishers 29<sup>th</sup> Edition, New Delhi, 2014
- T2** Suresh K. Dhameja, "Environmental Science and Engineering", S.K. Kataria & Sons Publications, New Delhi.

### BOS APPROVED REFERENCE BOOKS:

- R1** Peavy, Rowe and G Tchobanoglous, "Environmental Engineering", McGraw Hill Publications, New Delhi, 1985.
- R2** Muralikrishna K.V.S.G. "Air Pollution and Control", University Science Press, 2015.
- R3** Environmental Management & Impact Assessment, NPTEL Video Lectures
- R4** Solid & Hazardous Waste Management, NPTEL Video lectures.

## COURSE DELIVERY PLAN (LESSON PLAN)

### UNIT-I: AIR POLLUTION BASICS AND IMPACTS

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-History of air pollution	1	28.9.21	28.9.21	TLM2	
2.	Global air pollution	1	29.9.21	29.9.21	TLM2	
3.	Primary and secondary air pollutants	1	1.10.21	1.10.21	TLM2	
4.	Particulate pollutants	1	2.10.21	2.10.21	TLM2	
5.	Gaseous pollutants	1	5.10.21	5.10.21	TLM2	
6.	Impact of air pollution on humans	1	6.10.21	6.10.21	TLM2	
7.	Impact of air pollution on receptors	1	8.10.21	8.10.21	TLM2	
8.	Meteorological parameters	1	9.10.21	9.10.21	TLM2	
9.	Wind rose – Lapse rates	1	19.10.21	19.10.21	TLM2	
10.	Inversion – stack height	1	20.10.21	20.10.21	TLM2	
11.	Problems	1	22.10.21	22.10.21	TLM4	
12.	Plume rise – Gaussian model	1	23.10.21	23.10.21	TLM2	
13.	Problems	1	26.10.21	26.10.21	TLM4	
14.	No. of classes required to complete UNIT-I	13			13	

### UNIT-II: AIR POLLUTION CONTROL

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.	Gravity chamber, Cyclone separator	1	27.10.21	27.10.21	TLM2	
2.	Problems	1	29.10.21	29.10.21	TLM4	
3.	Bag filter, ESP	1	30.10.21	30.10.21	TLM2	
4.	Problems	1	2.11.21	2.11.21	TLM4	
5.	Wet collectors	1	3.11.21	3.11.21	TLM2	
6.	Gaseous control equipment	1	5.11.21	5.11.21	TLM2	
7.	Combustion, AAQ standards	1	6.11.21	6.11.21	TLM2	
8.	No. of classes required to complete UNIT-II	8	No. of classes taken		8	

**Mid-I Exam: Nov 8-13, 2021**

### UNIT-III: NOISE POLLUTION

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.	Noise pollution basics	1	19.11.21	19.11.21	TLM2	
2.	Noise rating systems	1	20.11.21	20.11.21	TLM2	
3.	Problems	1	23.11.21	23.11.21	TLM4	
4.	Noise standards	1	24.11.21	24.11.21	TLM2	
5.	Impacts and Noise control	1	26.11.21	26.11.21	TLM2	
6.	Noise Control	1	27.11.21	27.11.21	TLM2	
7.	Case study	1	30.11.21		TLM9	
8.	No. of classes required to complete UNIT-III	7	No. of classes taken		7	

**UNIT-IV: SOLID WASTE 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.	SWM Basics	1	1.12.21		TLM2	
2.	Properties of solid waste	1	3.12.21		TLM2	
3.	Problems	1	4.12.21		TLM4	
4.	Problems	1	7.12.21		TLM4	
5.	Compaction factor	1	8.12.21		TLM2	
6.	Collection of solid waste	1	10.12.21		TLM2	
7.	Litter collection	1	11.12.21		TLM2	
8.	Processing of solid waste	1	14.12.21		TLM2	
9.	Composting	1	15.12.21		TLM2	
10.	Landfill	1	17.12.21		TLM2	
11.	Problems	1	18.12.21		TLM4	
12.	Case study	1	21.12.21		TLM9	
13.	No. of classes required to complete UNIT-IV	12	No. of classes taken		12	

**UNIT-V: WASTE MANAGEMENT PRACTICES**

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.	Hazardous waste Management	1	22.12.21		TLM2	
2.	E waste Management	1	24.12.21		TLM2	
3.	Bio Medical waste Management	1	25.12.21		TLM2	
4.	CETP, TSDF	1	28.12.21		TLM2	
5.	EIA	1	29.12.21		TLM2	
6.	Env Audit	1	31.12.21		TLM2	
7.	No. of classes required to complete UNIT-V	6	No. of classes taken		6	

**Mid-II Exam: Jan 03-08, 2022**

Teaching Learning Methods					
<b>TLM1</b>	Chalk and Talk	<b>TLM4</b>	Problem Solving	<b>TLM7</b>	Seminars or GD
<b>TLM2</b>	PPT	<b>TLM5</b>	Programming	<b>TLM8</b>	Lab Demo
<b>TLM3</b>	Tutorial	<b>TLM6</b>	Assignment or Quiz	<b>TLM9</b>	Case Study

**EVALUATION PROCESS**

Evaluation Task	Marks
Assignment – 1	A1=5
Assignment – 2	A2=5
I-Mid Examination	M1=20
I-Quiz Examination	Q1=10
Assignment – 3	A3=5
Assignment – 4	A4=5
Assignment – 5	A5=5
II-Mid Examination	M2=20
II-Quiz Examination	Q2=10

Attendance	B = 5
Assignment Marks: A= Best Four average of A1,A2,A3,A4,A5	A=5
Mid Marks: M = 75% of Max (M1, M2) + 25% of Min (M1,M2)	M=20
Quiz Marks = 75% of Max (Q1, Q2) + 25% of Min (Q1,Q2)	Q=10
<b>Cumulative Internal Examination : A+B+M+Q</b>	<b>40</b>
<b>Semester End Examinations</b>	<b>60</b>
<b>Total Marks</b>	<b>100</b>

### PROGRAM OUTCOMES:

- Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and engineering specialization to the solution of complex engineering problems.
- Problem analysis:** Identify, formulate, research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural, sciences and engineering sciences.
- Design/development of solutions:** Design solutions for complex engineering problems and design system components, processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
- 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.
- 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.
- 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.
- 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.
- Ethics:** Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
- Individual and team work:** Function effectively as an individual, and as a member or leader in teams, and in multidisciplinary settings.
- Communication:** Communicate effectively 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.
- 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.
- 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 (PSOs)

PSO1: Possesses necessary skill set to analyze and design various systems using analytical and software tools related to civil engineering

PSO2: Possesses ability to plan, examine and analyze the various laboratory test required for the professional demands

PSO3: Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

<b>Course Instructor</b>	<b>Course Coordinator</b>	<b>Module Coordinator</b>	<b>HOD</b>



# 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 : B NARASIMHARAO  
Course Name & Code : ENVIRONMENTAL SANITATION & 17CE92  
L-T-P Structure : 3-0-0 Credits : 3  
Program/Sem/Sec : B.Tech., CE., VII-Sem., A.Y : 2021-22

**PRE-REQUISITE:NIL**

**COURSE EDUCATIONAL OBJECTIVES (CEOs):**This course teaches the basic terminology of Environmental sanitation, different methods for control of Communicable and non-communicable diseases, the control techniques for rodent and vectors, sanitation measures that are required in few Institutions, sanitation management aspects due to rural and refuse wastes.

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

CO 1	Recognize the basic terminology of Environmental sanitation.
CO 2	Interpret the control approaches of Communicable and non-communicable diseases.
CO 3	Identify and assess the control approaches for rodent and vectors.
CO 4	Classify the appropriate sanitation measures for several institutions.
CO 5	Categorize the sanitation aspects for rural and refuse management.

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2	1	-	-	-	1	1	-	-	-	-	1	1	-	1
CO2	2	1	1	-	-	1	1	-	-	-	-	1	1	-	1
CO3	2	1	1	-	-	1	1	-	-	-	-	1	1	-	1
CO4	2	1	2	-	-	1	1	-	-	-	-	1	1	1	1
CO 5	3	1	2	-	-	1	1	-	-	-	-	1	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** Joseph. A. Salvato, Nelson N. Nemerow, Frankiln J. Agardy, “Environmental Engineering”, John Wiley & Sons, 5th Edition, 2003.
- T2** I.M. Prahlad Edited, “Environmental Sanitation - Reflections from Practice, A Module for Community Health Practitioners”, Society For Community Health Awareness Research and Action, 2015.



**REFERENCE BOOKS:**

- R1** S.K. Garg, "Sewage Disposal and Air pollution engineering", Khanna Publishers, New Delhi, 2009.
- R2** K.V.S.G. Muralikrishna, "Environmental Sanitation", Reem Publications, Kakinada, 2003.

**PART-B****COURSE DELIVERY PLAN (LESSON PLAN):****UNIT –I: ENVIRONMENTAL SANITATION BASICS**

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, History and evolution of sanitation practices	1	27-09-2021		TLM2	
2.	Role of Sanitary Engineer	1	29-09-2021		TLM2	
3.	Sanitation management aspects for liquid and solid wastes	1	01-10-2021		TLM2	
4.	Basic Definitions	1	04-10-2021		TLM2	
5.	Types of diseases- Communicable diseases	1	06-10-2021		TLM2	
6.	Non-communicable diseases	1	08-10-2021		TLM2	
7.	Water borne diseases	1	11-10-2021		TLM2	
8.	Mortality rates	1	18-10-2021		TLM2	
No. of classes required to complete UNIT-I:08				No. of classes taken:		

**UNIT-II: CONTROL OF COMMUNICABLE AND NON-COMMUNICABLE DISEASES**

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.	<b>Communicable Diseases:</b> Impacts, Control of Source (Agent Factors)	1	22-10-2021		TLM2	
2.	Control of Mode of Transmission Factor (Environmental Factors)	1	25-10-2021		TLM2	
3.	Control of Susceptibles (Host Factors) and Epidemic Control	1	27-10-2021		TLM2	
4.	Respiratory Diseases- Types, Impacts, Characteristics and Control	1	29-10-2021		TLM2	
5.	Water borne Diseases- Types, Impacts, Characteristics and Control	1	01-11-2021		TLM2	
6.	Food borne Diseases- Types, Impacts, Characteristics and Control	1	03-11-2021		TLM2	
7.	Revision	1	05-11-2021			
No. of classes required to complete UNIT-II:07				No. of classes taken:		

**UNIT-III: INSECT VECTOR AND RODENT CONTROL**

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.	Mosquitoes as carriers of diseases	1	08-11-2021		TLM2	
2.	Mosquito control	1	10-11-2021		TLM2	
3.	Man-made mosquito breeding	1	12-11-2021		TLM2	

	centres					
4.	Outdoor control of mosquitoes	1	15-11-2021			TLM2
5.	Housefly as disease carrier-Fly control	1	17-11-2021			TLM2
6.	Rodent control	1	19-11-2021			TLM2
7.	Control Diseases transmitted from Animals.	1	22-11-2021			TLM2
No. of classes required to complete UNIT-III:07				No. of classes taken:		

#### UNIT- IV: INSTITUTIONAL SANITATION

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.	Sanitation measures in Hotels/restaurants	1	24-11-2021		TLM2	
2.	Sanitation measures in public bathing ghats	1	26-11-2021		TLM2	
3.	Sanitation measures in Schools	1	29-11-2021		TLM2	
4.	Sanitation measures in Hospitals	1	01-12-2021		TLM2	
5.	Sanitation measures in Swimming pools	1	03-12-2021		TLM2	
6.	Sanitation measures in Prisons.	1	06-12-2021		TLM2	
7.	Revision	1	08-12-2021		TLM2	
No. of classes required to complete UNIT-IV:07				No. of classes taken:		

#### UNIT-V :RURAL AND REFUSE SANITATION

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.	<b>Rural sanitation:</b> Aqua privy, Septic tank, Soak pit and sulabh mode of sanitation	1	10-12-2021		TLM2	
2.	<b>Rural sanitation:</b> Appropriate low cost rural sanitation techniques	1	13-12-2021		TLM2	
3.	<b>Rural sanitation:</b> Biogas generation from toilet	1	15-12-2021		TLM2	
4.	<b>Refuse Sanitation:</b> Municipal garbage – sources, generation and collection	1	17-12-2021		TLM2	
5.	<b>Refuse Sanitation:</b> Municipal garbage – recovery and disposal options	1	20-12-2021		TLM2	
6.	<b>Refuse Sanitation:</b> Sanitation problems with regard to: Dumping and sanitary landfilling	1	22-12-2021		TLM2	
7.	<b>Refuse Sanitation:</b> Sanitation problems with regard to: Mass firing of waste and incineration	1	24-12-2021		TLM2	
8.	<b>Refuse Sanitation:</b> Mosquito breeding, Leachate, Management	1	27-12-2021		TLM2	

	issues					
9.	<b>Ecological Sanitation:</b> Principle, Eco-sanitation as a sustainable approach	1	29-12-2021		<b>TLM2</b>	
10.	<b>Occupational health hazards:</b> Concept, Types, Safety aspects of sanitation workers	1	31-12-2021		<b>TLM2</b>	
No. of classes required to complete UNIT-V:10				No. of classes taken:		

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

## PART-C

### EVALUATION PROCESS (R17 Regulations):

Evaluation Task	Marks
Assignment-I (Unit-I)	A1=5
Assignment-II (Unit-II)	A2=5
I-Mid Examination (Units-I & II)	M1=20
I-Quiz Examination (Units-I & II)	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=20
II-Quiz Examination (Units-III, IV & V)	Q2=10
Attendance	B=5
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=20
Quiz Marks = 75% of Max(Q1,Q2)+25% of Min(Q1,Q2)	B=10
Cumulative Internal Examination (CIE) : A+B+M+Q	40
Semester End Examination (SEE)	60
Total Marks = CIE + SEE	100

## PART-D

### PROGRAMME OUTCOMES (POs):

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):

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

Course Instructor  
(B NARASIMHARAO)

Course Coordinator  
(B NARASIMHARAO)

Module Coordinator  
(J RANGAIAH)

HOD  
(Dr.V.RAMAKRISHNA)

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

**COURSE HANDOUT**

<b>PROGRAM</b>	: B.Tech., VII-Sem., CIVIL
<b>ACADEMIC YEAR</b>	: 2021-22
<b>COURSE NAME &amp; CODE</b>	: GIS and C A in Civil Engineering Lab (17CE73)
<b>L-T-P STRUCTURE</b>	: 0-0-2
<b>COURSE CREDITS</b>	: 1
<b>COURSE INSTRUCTOR</b>	: J.Rangaiah
<b>COURSE COORDINATOR</b>	: J.Rangaiah
<b>PRE-REQUISITE</b>	: Nil

**COURSE EDUCATIONAL OBJECTIVE:**

The course is designed to introduce GIS software and apply GIS software to simple problems in civil engineering problems. It also involves in developing coding in C language for civil engineering problems and analyzing results.

**COURSE OUTCOMES (CO) :**

1. Digitize and create thematic map and extract important features using GIS software.
2. Analyze and Interpret the maps created using GIS for specific applications.
3. Develop coding for civil engineering problems and analyze the results.

**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	1	1					1		3	1	1
CO2	2	2	3	2	1	1					1		3	1	1
CO3	2	2	3	2	1	1					1		3	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).

# **GIS AND COMPUTER APPLICATIONS IN CIVIL ENGINEERING LAB**

## **LIST OF EXPERIMENTS**

**COURSE: VII SEMESTER**

**A.Y: 2021-22**

1. Determination of Permeability of Soil
2. Design of Irrigation Channel by Kennedy's Theory
3. Design of Flexible Pavement
4. Design of Singly Reinforced Rectangular Beam for Flexure.
5. Determination of Discharge over a Rectangular, Triangular or Trapezoidal Notch.
6. Design of Sedimentation Tank
7. Design of Compression Member
8. Digitization of Map / Toposheet
9. Estimation of Features and Interpretation
10. Creation of Thematic Maps

**Lab-In charge**

## GIS AND COMPUTER APPLICATIONS IN CIVIL ENGINEERING LAB

**COURSE: VII SEMESTER**

**A.Y: 2021-22**

### LAB SCHEDULE

Sl.No	Name of the Experiment	Tentative Date	Actual Date
1	Determination of Permeability of Soil	30-09-2021	
2	Design of Irrigation Channel by Kennedy's Theory	07-10-2021	
3	Design of Flexible Pavement	21-10-2021	
4	Design of Singly Reinforced Rectangular Beam for Flexure.	28-10-2021	
5	Determination of Discharge over a Rectangular, Triangular or Trapezoidal Notch.	11-11-2021	
6	Design of Sedimentation Tank	18-11-2021	
7	Design of Compression Member	25-11-2021	
8	Digitization of Map / Toposheet	02-12-2021	
9	Estimation of Features and Interpretation	09-12-2021	
10	Creation of Thematic Maps	16-12-2021	
11	Revision	23-12-2021	
12	Internal Test	30-12-2021	

### ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	27-09-2021	06-11-2021	6 W
I Mid Examinations	08-11-2021	13-11-2021	1 W
II Phase of Instructions	15-11-2021	01-01-2022	7 W
II Mid Examinations	03-01-2022	08-01-2022	1 W
Preparation and Practicals	10-01-2022	15-01-2022	1 W
Semester End Examinations	17-01-2022	29-01-2022	2 W

**Lab-In charge**

**PROGRAMME OUTCOMES (POs):**

<b>PO 1</b>	<b>Engineering knowledge:</b> Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
<b>PO 2</b>	<b>Problem analysis:</b> Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
<b>PO 3</b>	<b>Design/development of solutions:</b> 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.
<b>PO 4</b>	<b>Conduct investigations of complex problems:</b> 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.
<b>PO 5</b>	<b>Modern tool usage:</b> 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.
<b>PO 6</b>	<b>The engineer and society:</b> 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.
<b>PO 7</b>	<b>Environment and sustainability:</b> Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
<b>PO 8</b>	<b>Ethics:</b> Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
<b>PO 9</b>	<b>Individual and team work:</b> Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
<b>PO 10</b>	<b>Communication:</b> 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.
<b>PO 11</b>	<b>Project management and finance:</b> 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.
<b>PO 12</b>	<b>Life-long learning:</b> 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):**

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

Course Instructor  
(J.RANGAIAH)

Course Coordinator  
(J.RANGAIAH)

Module Coordinator  
(J.RANGAIAH)

HOD  
(Dr.V.RAMAKRISHNA)



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

**COURSE HANDOUT**

<b>PROGRAM</b>	:	B.Tech., VII-Sem., CIVIL
<b>ACADEMIC YEAR</b>	:	2021-22
<b>COURSE NAME &amp; CODE</b>	:	Quantity Estimation & Project Management Lab(17CE73)
<b>L-T-P STRUCTURE</b>	:	0-0-2
<b>COURSE CREDITS</b>	:	1
<b>COURSE INSTRUCTOR</b>	:	P. M. Ganga Raju, B. Ramakrishna
<b>COURSE COORDINATOR</b>	:	P. M. Ganga Raju, B. Ramakrishna
<b>PRE-REQUISITE</b>	:	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) :**

4. Estimate the quantities for different items of civil engineering using software tools.
5. Prepare the estimate of different items of RCC elements.
6. 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	3	3		3		2	3				3		3		2
CO2	3	3		3		2	3				3		3		2
CO3	3	3		3		2	3				3		3		2

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

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

# QUANTITY ESTIMATION AND PROJECT MANAGEMENT LAB

## LIST OF EXPERIMENTS

**COURSE: VII SEMESTER**

**A.Y: 2021-22**

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

**Lab-In charge**

# QUANTITY ESTIMATION AND PROJECT MANAGEMENT LAB

COURSE: VII SEMESTER

A.Y: 2021-22

## LAB SCHEDULE

Sl.No	Name of the Experiment	Tentative Date	Actual Date
1	Quantity estimation of a single storey residential building (different items).	29-09-2021	
2	Cost estimation of a single storey residential building.	06-10-2021	
3	Quantity estimation of a B.T.Road (different items).	27-10-2021	
4	Cost estimation of a B.T.Road.	03-11-2021	
5	Quantity estimation of a Canal (different items).	17-11-2021	
6	Cost estimation of a Canal.	24-11-2021	
7	Quantity estimation of RCC roof slab and preparing schedule of bars.	01-12-2021	
8	Quantity estimation of RCC beam and preparing schedule of bars.	08-12-2021	
9	Estimation of Features and Interpretation	15-12-2021	
10	Preparing the Project management report for a single storey residential building/Road/Canal by using the Bar Chart/Mile stone chart.	22-12-2021	
11	Preparing the Project management report for a single storey residential building by using the network technique (PERT/CPM).	29-12-2021	
12	Preparing the Project management report for a B.T.Road by using the network technique (PERT/CPM).		

**Lab-In charge**

## 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

**Course Instructor**

**Course Coordinator**

**Module Coordinator**

**HOD**