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

LESSON PLAN

Name of Course Instructor :C.Rajamallu
Course Name & Code : Construction Technique and Equipment planning (17CE26)
L-T-P Structure : 3-1-0
Credits : 3
Program/Sem/Sec : B.Tech.,CE.,VI-Sem., Sections- A A.Y : 2021-2022

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: HISTORY OF CONSTRUCTION EQUIPMENTS

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.	Construction industry-safety-contracting environment	1	21/2/2022	21/2/2022	TLM2	
2.	Planning for earth work construction	1	24/2/2022	24/2/2022	TLM2	
3.	Compaction and stabilization equipment	1	25/2/2022	25/2/2022	TLM2	
4.	Compaction of soil and rocks-	1	28/2/2022	28/2/2022	TLM2	
5.	Types of compaction equipment	1	3/3/2022	3/3/2022	TLM2	
6.	Roller production estimating	1	4/3/2022	4/3/2022	TLM2	
7.	Dynamic compaction	1	7/3/2022	7/3/2022	TLM2	
8.	Soil stabilasation	1	10/3/2022	10/3/2022	TLM2	
9.	Cement soil stabilisation	1	11/3/2022	11/3/2022	TLM2	
10.	Tutorial	1	14/3/2022	14/3/2022	TLM2	
No. Of classes required to complete UNIT-I:10				No. of classes taken:10		

UNIT-II: DOZERS-SCRAPERS- EXCAVATORS

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.	Dozers: performance	1	18/3/2022	18/3/2022	TLM2	
2.	Blades-dozer production estimating	1	21/3/2022	21/3/2022	TLM2	
3.	Saftey. Land cleaning operation	1	24/3/2022	24/3/2022	TLM2	

4.	Types of equipement scrapers:types	1	25/3/2022	25/3/2022	TLM2	
5.	Operation - performance chart	1	28/3/2022	28/3/2022	TLM2	
6.	Production cycle operation considerations	1	31/3/2022	31/3/2022	TLM2	
7.	Scrapers saftey excuvators:	1	1/4/2022	1/4/2022	TLM2	
8.	Hydraulic excuvators - accidents	1	3/4/2022	3/4/2022	TLM2	
9.	Front shovels -- selecting a front shovel - production	1	3/4/2022	3/4/2022	TLM2	
10.	Hoes-bucket rating for hydraulic hoes – selecting a hoe	1	4/4/2022	4/4/2022	TLM2	
11.	Loaders buckets – operational specifications -- production rates – calculating wheel and track loader production	2	7/4/2022	7/4/2022	TLM 3	
No. Of classes required to complete UNIT-II:11			No. of classes taken:11			

UNIT-III: CRANES

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.	Major types	1	3/4/2022	3/4/2022	TLM2	
2.	Mobile cranes-crawler cranes	1	8/4/2022	8/4/2022	TLM2	
3.	Telescoping- boom truck.	1	11/4/2022	11/4/2022	TLM2	
4.	Mounted cranes-crane booms	1	21/4/2022	21/4/2022	TLM2	
5.	Lifting capacities of cranes	1	22/4/2022	22/4/2022	TLM2	
6.	Tower cranes –classification	1	25/4/2022	25/4/2022	TLM2	
7.	Selection of cranes	1	28/4/2022	28/4/2022	TLM2	
8.	Safetey	1	2/5/2022	2/5/2022	TLM2	
9.	Crane accidents	1	5/5/2022	5/5/2022	TLM2	
10.	Tutorial	1	6/5/2022	6/5/2022	TLM2	
No. Of classes required to complete UNIT-III:10				No. of classes taken:16		

UNIT-IV : PILE AND PILE DRIVING EQUIPEMENT

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction	1	9/5/2022	9/5/2022	TLM2	
2.	Pile types	1	12/5/2022	12/5/2022	TLM2	
3.	Driving piles	1	13/5/2022	13/5/2022	TLM2	
4.	Spudding and spudding and preagering	2	16/5/2022	16/5/2022	TLM2	

5.	Pile drive safety	1	17/5/2022	17/5/2022	TLM2	
6.	Air compressor and pumps	1	19/5/2022	19/5/2022	TLM2	
7.	Terms, compressed air distribution	1	20/5/2022	20/5/2022	TLM3	
8.	Gas laws	1	21/5/2022	21/5/2022	TLM2	
9.	Diversity factor	1	23/5/2022	23/5/2022	TLM2	
10.	Loss of head due to friction in pipe-safety	2	24/5/2022	24/5/2022	TLM3	
No. Of classes required to complete UNIT-IV:10				No. of classes taken:		

UNIT-V :FORM WORKS AND OTHER EQUIPEMENT

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.	Planning of building constructions	1	26/5/2022	26/5/2022	TLM2	
2.	Site layout	1	27/5/2022	27/5/2022	TLM2	
3.	Lifting and support equipement	1	28/5/2022	28/5/2022	TLM2	
4.	Delivery structural components	1	30/5/2022	30/5/2022	TLM2	
5.	Steel errection	1	2/6/2022	2/6/2022	TLM2	
6.	Tilt up constructions	1	3/6/2022	3/6/2022	TLM2	
7.	Control of construction nuisances	1	4/6/2022	4/6/2022	TLM2	
8.	MID-II exam	2	6/6/2022		TLM3	
9.		1	7/6/2022		TLM2	
10.		1	9/6/2022		TLM2	
11.		1	10/6/2022		TLM2	
12.		1	11/6/2022		TLM2	
13.		1	12/6/2022		TLM2	
14.		2	13/6/2022		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

Course Instructor	Course Coordinator	Module Coordinator	HOD
C.Rajamallu	C.Rajamallu	B.Ramakrishna	Dr.V.Ramakrishna

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : **Dr V. Ramakrishna**
Course Name & Code : 17CE22: Water and Wastewater Engineering
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CE., VI-Sem., Sections- A A.Y : 2021-22

PRE-REQUISITE: Environmental Studies, Mechanics of Fluids.

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course deals with concept of water demand and water quality parameters, design of water treatment units, sewage quality parameters, sewage treatment units, and sludge handling in sewage treatment.

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

CO1	**Estimate** the water demand for the community and assess the significance of water quality parameters
CO2	**Design** the sedimentation based water treatment systems
CO3	**Design** the filtration and disinfection based water treatment systems
CO4	**Interpret** the importance of sewage quality parameters and **design** the primary treatment units
CO5	**Design** the secondary treatment and sludge handling aspects sewage treatment plant

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	2	2	3								1	3	2	1
CO3	2	2	2	3								1	3	2	1
CO4	3	2	2	2								1	2	3	2
CO5	3	2	2	2								1	2	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).

TEXT BOOKS:

T1 B.C. Punmia, A.K. Jain and A.K. Jain, "Water Supply Engineering", Laxmi Publications, 2nd edition, 1995, Reprint 2005.

T2 B.C. Punmia, A.K. Jain and A.K. Jain, "Wastewater Engineering", Laxmi Publications, 2nd edition, 1996, Reprint 2014.

REFERENCE BOOKS:

R1 S.K. Garg, "Water Supply Engineering", Khanna Publishers, 26th Revised edition, New Delhi, 2010.

R2 S.K. Garg, "Sewage Disposal and Air Pollution Engineering", Khanna Publishers, 36th Revised edition, New Delhi, 2017.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Water Demand and Water Quality

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.	Necessity of water supply	1	23.2.22		2	
2.	Population forecast	1	24.2.22		2	
3.	Population forecast	1	26.2.22		2	
4.	Population forecast	1	2.3.22		2	
5.	Factors affecting water demand, fluctuations in demand	1	3.3.22		2	
6.	Sources of water, Physical parameters	1	5.3.22		2	
7.	Chemical parameters	1	9.3.22		2	
8.	Chemical parameters	1	10.3.22		2	
9.	Bacteriological parameters	1	16.3.22		2	
No. of classes required to complete UNIT-I: 9				No. of classes taken: 9		

UNIT-II: Water Treatment - Sedimentation

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.	Treatment objectives, Screening	1	17.3.22		2	
2.	Aeration	1	19.3.22			
3.	Stokes law	1	30.3.22		2	
4.	Problems	1	31.3.22		2	
5.	Coagulation concept	1	6.4.22		2	
6.	Jar test, Flash mixer	1	6.4.22		2	
7.	Flocculator	1	7.4.22		2	
8.	Clariflocculator	1	9.4.22		2	
9.	Problems	1	9.4.22		2	
No. of classes required to complete UNIT-II: 9				No. of classes taken: 9		

Mid-1: 11-4-22 to 16-4-22

UNIT-III: Water Treatment – Filtration & Disinfection

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.	Filtration Mechanism	1	20.4.22		2	
2.	Rapid sand filter	1	21.4.22		2	
3.	Slow sand filter	1	23.4.22		2	
4.	Problems	1	27.4.22		2	
5.	Problems	1	28.4.22		2	
6.	Forms of disinfection	1	30.4.22		2	
7.	Types of Chlorination	1	4.5.22		2	
8.	Problems	1	5.5.22		2	
No. of classes required to complete UNIT-III: 8				No. of classes taken: 8		

UNIT-IV: Sewage Quality & Primary Treatment

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.	Systems of sanitation, Decomposition cycles	1	4.5.22		2	
2.	Physical parameters	1	5.5.22		2	
3.	Physical parameters	1	7.5.22		2	
4.	Chemical parameters	1	11.5.22		2	
5.	BOD rate equation	1	11.5.22		2	
6.	Problems	1	14.5.22		2	
7.	Preliminary Treatment	1	14.5.22		2	
8.	Preliminary Treatment	1	18.5.22		2	
9.	Primary sedimentation tank design	1	18.5.22		2	
No. of classes required to complete UNIT-IV:9				No. of classes taken: 9		

UNIT-V: Secondary Treatment & Sludge Handling

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.	Biological growth & Processes	1	19.5.22		2	
2.	Activated sludge process	1	21.5.22		2	
3.	Complete mix process – design	1	25.5.22		2	
4.	Diffused aeration process-design	1	25.5.22		2	
5.	Trickling filter construction	1	26.5.22		2	
6.	Low rate filter, High rate filter	1	26.5.22		2	
7.	Sludge properties	1	28.5.22		2	
8.	Sludge digestion	1	1.6.22		2	
9.	Design of digester	1	2.6.22		2	
10.	Sludge dry beds, septic tank	1	4.6.22		2	
No. of classes required to complete UNIT-V:10				No. of classes taken:10		

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 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):

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

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 test required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Course Instructor	Course Coordinator	Module Coordinator	HOD
(Dr V. Ramakrishna)	(Dr V. Ramakrishna)	(J. Rangaiah)	(Dr V. Ramakrishna)

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COURSE HANDOUT

Part-A

PROGRAM : B.Tech,VI-SEM, Civil

ACADEMIC YEAR : 2021-22

COURSE NAME & CODE : **Design of Steel Structures** 17CE20

L-T-P STRUCTURE : **2**-2-0

COURSE CREDITS : 3

COURSE INSTRUCTOR : **B Rama krishna**

PRE-REQUISITES: Apllied Mechanics, Strength of Materials, Structural Analysis

COURSE EDUCATIONAL OBJECTIVES (CEOs): This course serves as introduction to the concepts of structural steel design through the use of the Indian Standard 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(COs): At the end of the course, the student will be able to:
CO1: **Identify** the different structural steel elements and their connection system
CO2: **Design** the compression and tension members.
CO3: **Analyze** and design the beams.
CO4: **Design** the column bases and built up columns.
CO5: **Design** the roof trusses.

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

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

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

BOS APPROVED TEXT BOOKS:

T1 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:

R1 S.S.Bhavikatti, "Design of Steel Structures", I.K. International Publishing House Pvt. Ltd, 4rd Edition, 2014. .

R2 V.L.Shah and Veena Gore; "Limit State Design of steel structures IS:800-2007"-, Structures Publications, 1st edition

Part-B

COURSE DELIVERY PLAN (LESSON PLAN):

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	Text Book followed	HOD Sign Weekly
1.	Introduction to Course and COs	1	22-02-2022		1	CO 1	T1	
2.	Introduction and fundamental concepts of design of structures	1	24-02-2022		1	CO 1	T1	
3.	Grades of steel and IS Specifications	1	25-02-2022		1	CO 1	T1	
4.	Different types of rolled sections	1	26-02-2022		1	CO 1	T1	
5.	Bolted connection & Strength and efficiency	1	03-03-2022		1	CO 1	T1	
6.	design of bolted joints	1	04-03-2022		1	CO 1	T1	
7.	Problems on bolted joints	1	05-03-2022		1	CO 1	T1	
8.	Introduction to welded joints	1	08-03-2022		1	CO 1	T1	
9.	Design of welded connection	1	10-03-2022		1	CO 1	T1	
10.	Problems on welded connection	1	11-03-2022		1	CO 1	T1	
11.	**Tutorial-1**	1	15-03-2022		3	CO 1	T1	
No. of classes required to complete UNIT-I		11			No. of classes taken:			

UNIT-II: DESIGN OF TENSION AND COMPRESSION MEMBERS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction	1	17-03-2022		1	CO 2	T1	
2.	Types of tension members	1	19-03-2022		1	CO 2	T1	
3.	Design of tension members	1	22-03-2022		1	CO 2	T1	
4.	Problems on tension members	1	24-03-2022		1	CO2	T1	
5.	Problems on tension members	1	25-03-2022		1	CO 2	T1	
6.	Introduction to compression members	1	26-03-2022		1	CO 2	T1	
7.	Different types of compression members	1	29-03-2022		1	CO 2	T1	
8.	Design of compression members	1	31-03-2022		1	CO 2	T1	
9.	Problems on compression members	1	01-04-2022		1	CO 2	T1	
10.	**Tutorial-2**	1	07-04-2022		3			
No. of classes required to complete UNIT-II		10			No. of classes taken:			

UNIT-III :DESIGN OF BEAMS

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction	1	08-04-2022		1	CO 3	T1	
2.	Types of sectionand IS Specifications	1	09-04-2022		1	CO 3	T1	
3.	Design of laterally supported beams	1	19-04-2022		1	CO 3	T1	
4.	Design of unsupported beams	1	21-04-2022		1	CO 3	T1	
5.	Design of built up	1	22-04-2022		1	CO3	T1	

	sections andCurtailment of flange plates							
6.	Problems on beams	1	23-04-2022		1	CO3	T1	
7.	Problems on beams	1	26-04-2022		1	CO3	T1	
8.	Web buckling and web crippling	1	28-04-2022		1	CO3	T1	
9.	Design problems	1	29-04-2022		1	CO3	T1	
10.	Design problems	1	30-04-2022		1	CO3	T1	
11.	**Tutorial-3**		05-05-2022		3			
No. of classes required to complete UNIT-III		12			No. of classes taken:			

UNIT-IV: BUILT-UP COLUMNS AND COLUMN BASES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to built up columns and IS Specifications	1	06-05-2022		1	CO 4	T1	
2.	Design of built up columns	1	07-05-2022		1	CO 4	T1	
3.	Problems on built up columns	1	10-05-2022		1	CO 4	T1	
4.	Design of lacing	1	12-05-2022		1	CO 4	T1	
5.	Design of battens	1	13-05-2022		1	CO 4	T1	
6.	Introduction to column bases & Design of slab base	1	14-05-2022		1	CO 4	T1	
7.	Design of gusseted base	1	17-05-2022		1	CO 4	T1	
8.	Design problems	1	19-05-2022		1	CO 4	T1	
9.	**Tutorial-4**		20-05-2022		3	CO 4	T1	
No. of classes required to complete UNIT-IV		09			No. of classes taken:			

UNIT-V: ROOF TRUSSES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction	1	21-05-2022		1	CO 5	T1	
2.	Types of trusses and loads	1	24-05-2022		1	CO 5	T1	
3.	IS 875 Standards for estimation of wind loads	1	26-05-2022		1	CO5	T1	
4.	Problems on wind loads	1	27-05-2022		1	CO5	T1	
5.	Design of members of roof truss and joints	1	28-05-2022		1	CO 5	T1	
6.	Design of purlins	1	31-05-2022		1	CO5	T1	
7.	Design problems	1	02-06-2022		1	CO5	T1	
8.	Design problems	1	03-06-2022		1	CO5	T1	
9.	**Tutorial-5**	1	04-06-2022		1	CO5	T1	
No. of classes required to complete UNIT-V		09			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			
TLM1	Chalk and Talk	**TLM4**	Demonstration (Lab/Field Visit)
TLM2	PPT	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM3	Tutorial	**TLM6**	Group Discussion/Project

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions-1	21-02-2022	09-04-2022	7W
I Mid Examinations	11-04-2022	16-04-2022	1W
II Phase of Instructions	18-04-2022	04-06-2022	7W
II Mid Examinations	06-06-2022	11-06-2022	1W
Preparation and Practicals	13-06-2022	18-06-2022	1W
Semester End Examinations	20-06-2022	02-07-2022	2W

Part – C

EVALUATION PROCESS:

Evaluation Task	COs	Marks
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
Cumulative Internal Examination: A+B+C+D	**1,2,3,4,5**	**40**
Semester End Examinations	**1,2,3,4,5**	**E=60**
Total Marks: A+B+C+D+E	**1,2,3,4,5**	**100**

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

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

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L.B.Reddy Nagar, Mylavaram-521230, Krishna Dist, Andhra Pradesh, India

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : K. HARISH KUMAR
Course Name & Code : GEOTECHNICAL ENGINEERING-II & 17CE23
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CE., VI-Sem., A.Y : 2021-22

PRE-REQUISITE: Geo technical engineering-1

COURSE EDUCATIONAL OBJECTIVES (CEOs): The course aims to teach the different conditions of site investigation for soil exploration. The course coverage includes the various procedures for determining the bearing capacity of various soils and get acquainted with the principles of soil mechanics in design of retaining walls.

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

CO 1	Interpret the principles of soil exploration.
CO 2	Design different types of foundations.
CO 3	Determine safe bearing capacity for design of buildings.
CO 4	Design different types of retaining walls.
CO 5	Design the special foundations and perform stability analysis of slopes.

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	-	-	1	1	1	3	-	-	-	-	3	2	1	2
CO2	3	3	-	1	1	1	3	-	-	-	-	3	3	1	2
CO3	3	3	-	1	1	1	3	-	-	-	-	3	3	1	2
CO4	3	3	3	1	1	1	3	-	-	-	-	3	3	1	2
CO 5	3	3	-	1	1	1	3	-	-	-	-	3	3	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).

TEXT BOOKS:

T1 Arora K.R, "**Soil Mechanics and Foundation Engineering**", Standard Publishers & Distributors, Nai Sarak, Delhi. 1987.

T2 B. C. Punmia, A. K. Jain. "**Soil Mechanics and Foundation Engineering**". Laxmi Publications, 16th edition, New Delhi, 2016.

REFERENCE BOOKS:

R1 Murthy.V.N.S, "**A Text book of Soil Mechanics and Foundation Engineering**", KripaTechnical Consultants, Bangalore, 1992

R2 C. Venkataramaiah, "**Geotechnical Engineering**", Wiley Eastern Ltd., Madras, 1993.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT –I: SITE INVESTIGATION AND SELECTION OF 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 to COs and UNIT-I	1	22.02.2022		TLM1	CO1	T1	
	Objective of site investigation				TLM1	CO1	T1	
2.	Methods of investigation	1	24.02.2022		TLM1	CO1	T1	
	Depth of soil exploration				TLM2	CO1	T1	
3.	Standard penetration test	1	03.03.2022		TLM1	CO1	T1	
4.	Soil sampling techniques	1	04.03.2022		TLM2	CO1	T1	
5.	Methods of obtaining undisturbed samples	1	08.03.2022		TLM2	CO1	T1	
6.	Functions and requisites of foundation	1	10.03.2022		TLM2	CO1	T1	
7.	Different types of shallow foundations and situations under which they are adopted.	1	11.03.2022		TLM2	CO1	T1	
No. of classes required to complete UNIT-I:07						No. of classes taken:		

UNIT-II: SHALLOW FOUNDATIONS AND BEARING CAPACITY OF SOILS

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.	Bearing Capacity of soils – Factors affecting Bearing capacity of soil & Terzaghi's bearing capacity theory	1	15.03.2022		TLM1	CO2	T1	
2.	Meyerhof's bearing capacity theory	1	17.03.2022		TLM1	CO2	T1	
3.	Plate bearing test and its limitations	1	22.03.2022		TLM2	CO2	T1	
4.	Settlement of foundation	1	24.03.2022		TLM2	CO2	T1	
5.	Methods of controlling settlement	1	25.03.2022		TLM2	CO2	T1	
6.	Problems	1	29.03.2022		TLM1	CO2	T1	
7.	Problems	1	31.03.2022		TLM1	CO2	T1 T2	
8.	**TUTORIAL-1 & 2**	1	01.04.2022		TLM1	CO1,2	T1 T2	
No. of classes required to complete UNIT-II:08						No. of classes taken:		

UNIT-III: DEEP FOUNDATIONS AND GROUP CAPACITY OF PILES

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.	Functions and Types of piles	1	07.04.2022		TLM2	CO3	T1	
2.	Estimation of individual pile capacity by Static approaches.	1	08.04.2022		TLM1	CO3	T1	
3.	Estimation of individual pile capacity by Dynamic approaches.	1	19.04.2022		TLM1	CO3	T1	
4.	Problems	1	21.04.2022		TLM1	CO3	T1 T2	
5.	Pile group efficiency	1	22.04.2022		TLM1	CO3	T1 T2	
6.	Pile load test	1	26.04.2022		TLM1	CO3	T1 T2	
7.	Problems	1	28.04.2022		TLM1	CO3	T1	
8.	**TUTORIAL-3**	1	29.04.2022		TLM1	CO3	T1 T2	
No. of classes required to complete UNIT-III:08						No. of classes taken:		

UNIT- IV: EARTH PRESSURE THEORIES AND 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.	Rankine's active earth pressure theory	1	05.05.2022		TLM1	CO4	T1	
2.	Rankine's passive earth pressure theory	1	06.05.2022		TLM1	CO4	T1	
3.	Coulomb's earth pressure theory	1	10.05.2022		TLM1	CO4	T1	
4.	Problems	1	12.05.2022		TLM1	CO4	T1 T2	
5.	Problems	1	13.05.2022		TLM1	CO4	T1 T2	
6.	Different types of Retaining Walls and Design principles	1	17.05.2022		TLM2	CO4	T1	
7.	Problems	1	19.05.2022		TLM1	CO4	T1 T2	
No. of classes required to complete UNIT-IV:07						10.05.2022		

UNIT-V: SPECIAL FOUNDATIONS AND STABILITY OF SLOPES

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.	Caisson Foundation – Necessity of selection, Types of Caisson foundation	1	20.05.2022		TLM2	CO5	T1	
2.	Foundation in filled up grounds	1	24.05.2022		TLM2	CO5	T1	
3.	Foundation on expansive soil	1	26.05.2022		TLM2	CO5	T1	
4.	under-reamed pile foundations	1	27.05.2022		TLM1	CO5	T1	
5.	Stability analysis of finite earth slopes	1	31.05.2022		TLM2	CO5	T1	
6.	Taylor's stability number and its significance	1	02.06.2022		TLM2	CO5	T1	
7.	**TUTORIAL-4 & 5**	1	03.06.2022		TLM1	CO4,5		
No. of classes required to complete UNIT-V:07						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 CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	21-02-2022	09-04-2022	7W
I Mid Examinations	11-04-2022	16-04-2022	1W
II Phase of Instructions	18-04-2022	04-06-2022	7W
II Mid Examinations	06-06-2022	11-06-2022	1W
Preparation and Practicals	13-06-2022	18-06-2022	1W
Semester End Examinations	20-06-2022	02-07-2022	2W

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):

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 analyse the various laboratory tests required for the professional demands
PSO 3	Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain

Course Instructor	Course Coordinator	Module Coordinator	HOD
(K HARISH KUMAR)	(K HARISH KUMAR)	(B NARASIMHARAO)	(Dr.V.RAMAKRISHNA)

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Department of Civil Engineering

COURSE HANDOUT

Part-A

PROGRAM : B.Tech., VI-Sem., CE

ACADEMIC YEAR : 2021-22

COURSE NAME & CODE : **Industrial Engineering & Management**– 17MB80

L-T-P STRUCTURE : 3-0-0

COURSE CREDITS : 3

COURSE INSTRUCTOR : **N. SAMBASIVA RAO**

COURSE COORDINATOR : Mr. U Rambabu

PRE-REQUISITE:

COURSE OBJECTIVE: Principles of management, Human resource management, Production management, Project management.

1. To make students understand management, its principles, contribution to management, organization, and its basic issues and types
2. To make student s understand the concept of plant location and its factors and plant layout and types, method of production and work study importance
3. To understand the purpose and function of statistical quality control and material management techniques
4. To make students understand the concept of HRM and its functions
5. To make students understand PERT & CPM methods in effective project management and need of project crashing and its consequence on cost of project

COURSE OUTCOMES (CO)

CO1	Apply management principles to the particle situations to be in a position to know which type of business organization structure suits
CO2	Able to make decision making relating to the problems in operations and production activities thereby improving the productivity by proper utilisation input factors by designing the better
CO3	Able to improve quality of working through SQC techniques and to take effective decision making relating to reduce the investment in materials through better control of inventory
CO4	Able to manage people in working environment with the practices of HRM across corporate businesses
CO5	Able to use PERT & CPM techniques in effective project management to identify critical path and try to complete projects on time as well as reducing the project durations if need anses.

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

COs	a	b	c	d	e	f	g	h	i	j	k	l	PSOa	PSOb	PSOc	PSOd
CO1	-	-	-	2	3	2	-	-	2	-	3	3	-	-	-	-
CO2	-	-	-	2	3	2	-	-	2	-	3	3	-	-	-	-
CO3	-	-	-	2	3	2	-	-	2	-	3	3	-	-	-	-
CO4	-	-	-	2	3	2	-	-	2	-	3	3	-	-	-	-
CO5	-	-	-	2	3	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).

BOS APPROVED TEXT BOOKS:

T1 Dr.A.R.Aryasri,ManagementScience,TMH,10th edition,2012

BOS APPROVED REFERENCE BOOKS:

R1 Koontz&weihrich-Essentialsofmanagement,TMH,10111edition,2015
R2 Stoner,Freeman,Gilbert,Management,6111editionPearsoneducation,NewDelhi, 2004
R3 BernardW.Taylor-IntroductiontoManagement ScienceTwelfthEdition
O.P.Khana,IndustrialengineeringandManagementL.S.Srinath,PERT&CPM

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	Learning Outcome COs	Text Book followed	HOD Sign Weekly
1.	Introduction to Subject, Course Outcomes, Management - Definition, Nature	01	21.02.2022		**TLM 1**	CO1	T1	
2.	Importance of management Functions of Management	01	22.02.2022		**TLM 1**	CO1	T1	
3.	Taylor's scientific management theory	01	26.02.2022		**TLM 1**	CO1	T1	
4.	Fayal's principles of management	01	28.02.2022		**TLM 1**	CO1	T1	
5.	Contribution of Elton mayo, Maslow	01	05.03.2022		**TLM 1**	CO3	T1	
6.	Herzberg, Douglas MC Gregor,	01	07.03.2022		**TLM 2**	CO1	T1	
7.	Basic Concepts of Organization - Authority, Responsibility Delegation of Authority, span of control, departmentation	01	08.03.2022		**TLM 1**	CO1	T1	
8.	Organization structures (Line organization, Line a staff organization	01	12.03.2022		**TLM 3**	CO1	T1	
9.	Functional organization, Committee organization, Matrix organization	01	14.03.2022		**TLM 6**	CO1	T1	
No. of classes required to		09		No. of classes taken:				

complete UNIT-I				

Unit-II Operations Management

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 UNIT-II	01	15.03.2022		**TLM1**	CO2	T1	
2.	Plantlocation	01	19.03.2022		**TLM1**	CO2	T1	
3.	Factorsinfluencinglocation	01	21.03.2022		**TLM2**	CO2	T1	
4.	Principlesandtypesofplant layouts	01	22.03.2022		**TLM1**	CO2	T1	
5.	Methodsofproduction Job,batch andmassproduction	01	26.03.2022		**TLM2**	CO2	T1	
6.	Work study, Basic procedure involved in method study	01	28.03.2022		**TLM1**	CO2	T1	
7.	Work measurement	01	29.03.2022		**TLM1**	CO2	T1	
No. of classes required to complete UNIT-II		07		No. of classes taken:				

Unit-III Statistical Quality Control & Materials Management

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 UNIT-III,	01	04.04.2022		**TLM1**	CO3	T1	
2.	Statistical quality control	01	09.04.2022		**TLM1**	CO3	T1	
3.	Concept of Quality & Quality Control	01	18.04.2022		**TLM2**	CO3	T1	
4.	functions ,Meaningof SQC	01	19.04.2022		**TLM1**	CO3	T1	
5.	Variables and attributes		23.04.2022			CO3	T1	
6.	X chart, R Chart, C Chart, P Chart,(simple Problems)	01	25.04.2022		**TLM1**	CO3	T1	
7.	X chart, R Chart, C Chart, P Chart,(simple Problems)	01	26.04.2022		**TLM1**	CO3	T1	
8.	Acceptance sampling, Sampling plans	01	30.04.2022		**TLM1**	CO3	T1	
9.	Deming 's contribution to quality.	01	02.05.2022		**TLM1**	CO3	T1	

10.	Materials management - Meaning and objectives	01	07.05.2022		**TLM1**	CO3	T1	
11.	inventory control-Need for inventory control	01	09.05.2022		**TLM1**	CO3	T1	
12.	Purchase procedure	01	10.05.2022		**TLM1**	CO3	T1	
13.	Store records:EOQ, ABC analysis, Stock levels	01	14.05.2022		**TLM1**	CO3	T1	
No. of classes required to complete UNIT-III		13		No. of classes taken:				

UNIT IV – Human Resource management (HRM):

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 UNIT-IV	01	14.05.2022		**TLM1**	CO2	T1	
2.	Concepts of HRM	01	16.05.2022		**TLM1**	CO2	T1	
3.	Basic functions of HR manager: Man power plarming	01	17.05.2022		**TLM1**	CO2	T1	
4.	Recruitment , Selection, Training and development	01	21.05.2022		**TLM1**	CO4	T1	
5.	Placement, Wage and salary administration	01	23.05.2022		**TLM1**	CO2	T1	
6.	Promotion, Transfers Separation, performance appraisal	01	24.05.2022		**TLM1**	CO4	T1	
7.	Job evaluation and merit rating	01	24.05.2022		**TLM2**	CO4	T1	
No. of classes required to complete UNIT-IV		07	28.05.2022		No. of classes taken:			

Unit-V Project management

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 UNIT-V	01	28.05.2022		**TLM1**	CO5	T1	
2.	Early teclmiques in project management	01	30.05.2022		**TLM1**	CO5	T1	
3.	Network analysis: Programme evaluation and review teclmique (PERT),	01	31.05.2022		**TLM2**	CO5	T1	
4.	Critical path method (CPM), Identifying critical path	01	31.05.2022		**TLM1**	CO5	T1	
5.	Probability of completing project within given time	01	31.05.2022		**TLM1**	CO5	T1	

6.	Project cost analysis, project crashing	01	04.06.02022		**TLM3**	CO5	T1	
7.	simple problems	01	04.06.02022		TLM3	CO5	T1	
No. of classes required to complete UNIT-V		08			No. of classes taken:			

Teaching Learning Methods			
TLM1	Chalk and Talk	**TLM5**	ICT (NPTEL/Swayam Prabha/MOOCS)
TLM2	PPT	**TLM6**	Assignment or Quiz
TLM3	Tutorial	**TLM7**	Group Discussion/Project
TLM4	Demonstration (Lab/Field Visit)		

ACADEMIC CALENDAR:

Description	From	To	Weeks
I Phase of Instructions	21.02.2022	09.04.2022	7W
I Mid Examinations	11.04.2022	16.04.2022	1W
II Phase of Instructions	18.04.2022	04.06.2022	9W
II Mid Examinations	06.06.2022	11.06.2022	1W
Preparation and Practicals	13.06.2022	18.06.2022	1 W
Semester End Examinations	20.06.2022	02.07.2022	2W

Part - C

EVALUATION PROCESS:

Evaluation Task	COs	Marks
Assignment/Quiz – 1	1	A1=5
Assignment/Quiz – 2	2	A2=5
I-Mid Examination	1,2	B1=20
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
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,B2)	1,2,3,4,5	B=20
Cumulative Internal Examination : A+B	1,2,3,4,5	A+B=25
Semester End Examinations	1,2,3,4,5	C=75
Total Marks: A+B+C	1,2,3,4,5	100

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs)

PEO I:To inculcate the adaptability skills into the students for software design, software development or any other allied fields of computing.

PEO II: To equip the graduates with the ability to analyze, design and synthesize data to create novel products.

PEO III: Ability to understand and analyze engineering issues in a broader perspective with ethical responsibility towards sustainable development.

PEO IV: To empower the student with the qualities of effective communication, team work, continues learning attitude, leadership needed for a successful computer professional. .

PROGRAMME OUTCOMES (POs)

Engineering Graduates will be able to

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

Problem analysis: Identify, formulate, review research literature, and analyze complex engineeringproblems 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 or 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 includingprediction 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 diverse teams, and in multidisciplinary settings.

Communication: Communicate effectively on complex engineering activities withthe 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 andleader 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):

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

N.SAMBASIVA RAO	Mr U Rambabu	Dr. A ADISESHA REDDY	Dr. A ADISESHA REDDY
Course Instructor	**Course Coordinator**	**Module Coordinator**	**HOD**

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : P.KEERTHI
Course Name : IRRIGATION AND WATER RESOURCES ENGINEERING
Course Code : 17CE21
L-T-P Structure : 3-1-0 Credits : 3
Program/Sem/Sec : B.Tech., CE., VI-Sem., A.Y : 2021-22

PRE-REQUISITE: Mechanics of Fluids, Hydraulics and Hydraulic Machinery Systems, Hydrology

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The course is designed to know the concepts of analysis and design of Storage and Diversion Head Works and introduce the types of Irrigation Systems. It also addresses the concepts of planning and design of Irrigation water requirements, design methods of erodible and non-erodible canals.

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

CO 1	Analyze the stability of Gravity dams
CO 2	Design the impervious floors for Diversion Head Works.
CO 3	Estimate Irrigation Water Requirements.
CO 4	Design the erodible and non-erodible canals
CO 5	Interpret the design principles of Cross Drainage Works

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	2	2	1	2					1		1		3
CO2	3	2	2	2	1	2					1		1		3
CO3	3	3	3	2	2	2	1				1		1		3
CO4	2	2	2	2	1	2					1		1		3
CO5	2	2	2	2	1	2					1		1		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:

T1 B C Punmia, B.B Lal, A.K. Jain and A.K. Jain; „Irrigation and Water Power Engineering", Laxmi Publications Pvt. Ltd., New Delhi. 2015.

T2 Santosh Kumar Garg, "Irrigation Engineering and Hydraulic Structures: Water Resources Engineering - Vol. II", Khanna Publishers; 2017.

REFERENCE BOOKS:

R1 Ch. Satyanarayana Murthy, "Water Resources Engineering", New Age International Publishers; 2002.

R2 P.N. Modi, "Irrigation Water Resources and Water Power Engineering", Standard Book House, New Delhi; 2008.

R3 Water Resources Engineering, NPTEL video lectures and web notes

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: DAMS

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 dams, Gravity dams:drainage galleries, grouting.	1	23.02.2022		TLM1	
2.	Selection of type of dam, selection of site for a dam.	1	24.02.2022		TLM1	
3.	Forces acting on a gravity dam, causes of failure of a gravity dam,	1	25.02.2022		TLM1	
4.	Elementary profile and practical profile of a gravity dam,	1	26.02.2022		TLM1	
5.	Limiting height of a dam	1	02.03.2022		TLM1	
6.	**Tutorial-1**	1	03.03.2022		TLM3	
7.	Problems	1	04.03.2022		TLM1	
8.	Stability analysis	1	05.03.2022		TLM1	
9.	Problems	1	09.03.2022		TLM1	
10.	Problems	1	10.03.2022		TLM1	
11.	Problems	1	11.03.2022		TLM1	
12.	**Tutorial-2**	1	16.03.2022		TLM3	
13.	Drainage galleries,	1	17.03.2022		TLM1	

	grouting.					
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: DIVERSION HEAD 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.	Types of diversion head works, weirs and barrages, layout of diversion head works, components	1	19.03.2022		TLM1	
2.	Causes and failures of weirs on permeable foundations	1	23.03.2022		TLM1	
3.	Bligh‟s creep theory	1	24.03.2022		TLM1	
4.	**Tutorial-3**	1	25.03.2022		TLM3	
5.	Khosla‟s theory	1	27.04.2021		TLM1	
6.	Problems	1	26.03.2022		TLM1	
7.	Design of impervious floors for subsurface flow, exit gradient.	1	30.03.2022		TLM1	
8.	Problems	1	31.03.2022		TLM1	
9.	Problems	1	01.04.2022		TLM1	
10.	Spillways: Types, design principles of Ogee spillways,	1	06.04.2022		TLM1	
11.	**Tutorial-4**	1	07.04.2022		TLM3	
12.	Types of spillways crest gates. Energy dissipation below spillways-stilling basin and its appurtenances	1	08.04.2022		TLM1	
No. of classes required to complete UNIT-II: 10				No. of classes taken:		

UNIT III: IRRIGATION

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.	Necessity and Importance of Irrigation, advantages and ill effects of Irrigation	1	20.04.2022		TLM1	
2.	Types of Irrigation	1	21.04.2022		TLM1	
3.	Methods of application of Irrigation water,	1	22.04.2022		TLM1	
4.	Water logging and drainage, principal	1	23.04.2022		TLM1	

	crops and crop seasons, crop rotation					
5.	Soil-water-plant relationship, estimation of consumptive use	1	27.04.2022		TLM1	
6.	Duty and delta, factors affecting duty	1	28.04.2022		TLM1	
7.	Problems	1	29.04.2022		TLM1	
8.	**Tutorial-5**	1	30.04.2022		TLM3	
9.	depth and frequency of Irrigation		04.05.2022		TLM1	
10.	Irrigation efficiencies.	1	05.05.2022		TLM1	
No. of classes required to complete UNIT-III:9				No. of classes taken:		

UNIT-IV: CANALS AND REGULATORS

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.	Canals: Classification	1	06.05.2022		TLM1	
2.	Design of non-erodible canals	1	07.05.2022		TLM1	
3.	Problems	1	11.05.2022		TLM1	
4.	Methods of economic section and maximum permissible velocity, economics of canal lining	1	12.05.2022		TLM1	
5.	design of erodible canals -Kennedy‟s silt theory	1	13.05.2022		TLM1	
6.	Lacey‟s regime theory	1	18.05.2022		TLM1	
7.	Problems	1	19.05.2022		TLM1	
8.	Head regulators, design principles.	1	20.05.2022		TLM1	
9.	**Tutorial -6**	1	21.05.2022		TLM3	
10.	Cross regulators, design principles.	1	25.05.2022		TLM1	
No. of classes required to complete UNIT-IV:9				No. of classes taken:		

UNIT-V: CANAL FALLS AND CROSS DRAINAGE 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.	Canal Falls: Types and location	1	26.05.2022		TLM1	
2.	Design principles of Sarda type fall	1	27.05.2022		TLM1	
3.	Design principles of Straight glacis fall.	1	28.05.2022		TLM1	

4.	Cross Drainage Works: Types, Selection	1	01.06.2022		TLM1	
5.	Design principles of aqueduct, siphon aqueduct	1	02.06.2022		TLM-1	
6.	**Tutorial -7**	1	04.06.2022		TLM3	
7.	Design principles of super passage	1	03.06.2022		TLM1	
No. of classes required to complete UNIT-V: 6				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 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):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor	Course Coordinator	Module Coordinator	HOD
(P.KEERTHI)	(P.KEERTHI)	(J.RANGAIAH)	(Dr.V.RAMAKRISHNA)

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : P Mohana Ganga Raju
Course Name & Code : Low Cost & Eco-Friendly Building Technology-17CE91
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CE., VI-Sem., Sections- A A.Y : 2021-2022

PRE-REQUISITE: Nil

COURSE EDUCATIONAL OBJECTIVES (CEOs): The course focuses on study of available traditional and eco-friendly materials, Eco friendly and cost effective technologies, Eco-friendly building materials, rural housing approaches in disaster prone areas.

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

CO 1	**Select** appropriate traditional materials for construction.
CO 2	**Select** appropriate eco-friendly materials for construction.
CO 3	**Analyze** the eco friendly technologies for low cost construction.
CO 4	**Describe** prefabrication techniques and assess the wind effects on low rise buildings.
CO 5	**Categorize** the approaches followed in disaster prone areas.

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	2	1	3
CO2	-	-	-	-	2	2	3	-	-	-	-	1	2	1	3
CO3	-	-	-	-	2	2	3	-	-	-	-	3	2	-	3
CO4	-	-	-	-	2	1	3	-	-	-	-	3	2	-	3
CO4	-	-	-	-	2	2	3	-	-	-	-	3	2	-	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:

T1 A.G.Madhavrao, D.S.Ramachandramurthy –Appropriate technologies for low cost housing-oxford & IBH Publishing, 1996.

T2 A K Lal, "Hand Book of Low Cost Housing", New Age Publishing, 1995.

REFERENCE BOOKS:

R1 N. Kumara Swamy and A. Kameswara Rao, "Building Planning and Drawing", Charotar Publications, 2013.

R2 S K Duggal, "Building materials", New Age International Publishers. 2012.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: Traditional Building Materials

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	21-02-2022		**TLM2**	
2.	Introduction-housing scenario in India	1	23-02-2022		**TLM2**	
3.	Traditional building materials-stabilized soil bricks, improved mud and thatch	1	25-02-2022		**TLM2**	
4.	Burnt and unburned bricks, laterite-lime bricks,	1	28-02-2022		**TLM2**	
5.	Sand-lime blocks, stone block masonry units	1	02-03-2022		**TLM2**	
6.	Bamboo, hollow cement blocks	1	04-03-2022		**TLM2**	
7.	Light weight concrete blocks, wood-cement products	1	07-03-2022		**TLM2**	
8.	Fly ash bricks, cementitious binder from rice husk, lime based binders	1	09-03-2022		**TLM2**	
No. of classes required to complete UNIT-I:08				No. of classes taken:		

UNIT-II: Eco-Friendly Building Materials

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.	Basics and practical applications of locally available building materials- Soil, Fly ash,	1	11-03-2022		**TLM2**	
2.	Ferrocement, Lime, Fibres, Stone Dust	1	14-03-2022		**TLM2**	
3.	Red mud, Gypsum, Alternate Wood,	1	16-03-2022		**TLM2**	
4.	Polymer-ADOBE, Light Clay, Straw-Bale,	1	21-03-2022		**TLM2**	
5.	Bamboo, Agro-Industrial Waste,	1	23-03-2022		**TLM2**	
6.	Innovative materials developed by CBRI, SERC	1	25-03-2022		**TLM2**	
7.	Structural Properties of Alternate Building Materials, Earthen Finishes, Earth Plasters, Earth Floors	1	28-03-2022		**TLM2**	
No. of classes required to complete UNIT-II:07				No. of classes taken:		

UNIT-III: Improved Building Technologies

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.	**Foundations:** Introduction, types of soli, types of foundations	1	30-03-2022		**TLM2**	
2.	Permissible settlements, soil investigations	1	01-04-2022		**TLM2**	
3.	**Walls:** Introduction, stabilized earth wall construction, building	1	11-04-2022		**TLM2**	

	blocks (lato blocks) from lateritic soil					
4.	Brick masonry walls, cellular concrete blocks, hallow concrete blocks	1	13-04-2022		**TLM2**	
5.	Shell type houses made of hallow clay blocks, precast concrete panels	1	18-04-2022		**TLM2**	
6.	**Roofs:** Introduction, catenary hollow clay blocks/brick shell roofs	1	20-04-2022		**TLM2**	
7.	Precast reinforced concrete-channel units-cored units	1	21-04-2022		**TLM2**	
8.	Roofing system with cellular unit, cellular light weight concrete roofing system	1	25-04-2022		**TLM2**	
No. of classes required to complete UNIT-III:08				No. of classes taken:		

UNIT-IV : Pre-Fabrication And Wind Effects

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.	**Pre-fabrication:** Introduction, advantages of pre-fabrication	1	27-04-2022		**TLM2**	
2.	Areas where prefabrication techniques can be introduced	1	29-04-2022		**TLM2**	
3.	Joints in precast concrete structures	1	02-05-2022		**TLM2**	
4.	**Wind effects on low rise buildings:** Introduction	1	04-05-2022		**TLM2**	
5.	Wind structure interaction concepts, codal provision	2	06-05-2022, 09-05-2022		**TLM2**	
6.	Housing in cyclone prone areas	1	11-05-2022		**TLM2**	
7.	Cyclone resisting core units	1	13-05-2022		**TLM2**	
No. of classes required to complete UNIT-IV: 08				No. of classes taken:		

UNIT-V : Rural Housing And Housing In Disaster Prone Areas

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.	**Rural housing:** Introduction, traditional practice of rural house construction	1	16-05-2022		**TLM2**	
2.	Appropriate rural housing technology	1	18-05-2022		**TLM2**	
3.	Mud housing technology, mud roofs, characteristics of mud	1	20-05-2022		**TLM2**	
4.	Fire retardant treatment for trench roof	1	23-05-2022		**TLM2**	
5.	**Housing in disaster prone areas:** Introduction, traditional houses in disaster prone areas	1	25-05-2022		**TLM2**	
6.	Types of damages failures of non engineered buildings	1	27-05-2022		**TLM2**	
7.	Repair and rehabilitation of earthquake damaged non engineered buildings	1	30-05-2022		**TLM2**	
8.	Recommendations for feature	1	01-06-2022		**TLM2**	

	construction					
9.	Revision	1	03-06-2022			
No. of classes required to complete UNIT-V:08				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 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):

PO 1	**Engineering knowledge**: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
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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	Module Coordinator	HOD
P. Mohana Ganga Raju	B. Rama Krishna	Dr. V. Rama Krishna

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. K.V.RAMANA, Sri M. Satyanarayana

Course Name & Code : COMPUTER AIDED ANALYSIS AND DESIGN LAB & 17CE72

L-T-P Structure : 0-0-2 Credits : 1

Program/Sem/Sec : B.Tech., CE., VI-Sem., A.Y : 2021-22

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: 2021-22I–CYCLE

SCHEDULE

Date / Batch	A1	A2	A3	A4	A5	A6
21-02-2022	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
28-02-2022	1	1	1	1	1	1
07-03-2022	2	2	2	2	2	2
14-03-2022	3	3	3	3	3	3
21-03-2022	4	4	4	4	4	4
28-03-2022	5	5	5	5	5	5
04-04-2022	6	6	6	6	6	6

Date / Batch	B1	B2	B3	B4	B5	B6
23-02-2022	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
02-03-2022	1	1	1	1	1	1
09-03-2022	2	2	2	2	2	2
16-03-2022	3	3	3	3	3	3
23-03-2022	4	4	4	4	4	4
30-03-2022	5	5	5	5	5	5
06-04-2022	6	6	6	6	6	6

II CYCLE SCHEDULE

Date / Batch	A1	A2	A3	A4	A5	A6
18-4-2022	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
25-04-2022	7	7	7	7	7	7
02-05-2022	8	8	8	8	8	8
09-05-2022	9	9	9	9	9	9
16-05-2022	10	10	10	10	10	10
23-05-2022	11	11	11	11	11	11
30-05-2022	12	12	12	12	12	12

Date / Batch	B1	B2	B3	B4	B5	B6
20-04-2022	DEMO	DEMO	DEMO	DEMO	DEMO	DEMO
27-04-2022	7	7	7	7	7	7
04-05-2022	8	8	8	8	8	8
11-05-2022	9	9	9	9	9	9
18-05-2022	10	10	10	10	10	10
25-05-2022	11	11	11	11	11	11
01-06-2022	12	12	12	12	12	12

Batch A (19761A0136 to 20765A0107), **Monday**

Batch B (19761A0101 to 19761A0135)**, Wednesday**

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.
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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	Course Coordinator	Module Coordinator	HOD
(Dr. K.V. Ramana)	(Dr. K.V. Ramana)	(Sri B.Ramakrishna)	(Dr. V. Ramakrishna)

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COURSE HANDOUT

PROGRAM	**:**	B.Tech., VI-Sem., CIVIL
ACADEMIC YEAR	**:**	2020-21
COURSE NAME & CODE	**:**	ENVIRONMENTAL ENGINEERING LAB (17CE71)
L-T-P STRUCTURE	**:**	0-0-2
COURSE CREDITS	**:**	2
COURSE INSTRUCTOR	**:**	Dr.V.RAMAKRISHNA
COURSE COORDINATOR	**:**	Dr.V.RAMAKRISHNA
PRE-REQUISITE	**:**	Nil

COURSE OBJECTIVE:

This course deals with the laboratory approaches of determining certain major parameters related to water and waste water quality and analyzing the laboratory data with respect to permissible limits and field conditions.

COURSE OUTCOMES:

CO1: Perform the different laboratory techniques for examining the water quality parameters.
CO2: Perform the different laboratory techniques for examining the wastewater quality parameters.
CO3: Analyzing the laboratory data and comment with respect to permissible limits and field conditions

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

COs	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2	PSO 3
CO1	3	2	2	3	2	1	1	-	1	1	1	-	2	2	2
CO2	2	3	3	2	1	1	1	-	1	1	1	-	1	2	2
CO3	2	3	3	2	1	1	1	-	1	1	1	-	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).

17CE71 – ENVIRONMENTAL ENGINEERING LAB

Course Instructor: Dr. V. RAMAKRISHNA B.Tech(VI Sem)

P. KEERTHI A.Y 2021-22

CYCLE-1

C-1-1.Determination of Turbidity of water sample.

C-1-2.Determination of Acidity of water sample.

C-1-3.Determination of pH value and Conductivity.

C-1-4.Determination of TDS in water sample.

C-1-5.Determination of Dissolved Oxygen of water sample.

C-1-6.Determination of Optimum dose of coagulant.

CYCLE-2

C-2-1.Determination of Total, temporary and permanent hardness of water sample.

C-2-2.Determination of Total, Calcium and Magnesium hardness of water sample.

C-2-3.Determination of Chloride concentration of water sample.

C-2-4.Determination of Alkalinity of water sample.

C-2-5.Determination of Settleable solids using Imhoff cone in sewage sample.

C-2-6.Determination of Total, fixed and volatile solids in sewage sample.

CYCLE-3

C-3-1.Determination of Suspended, fixed and volatile solids in sewage sample.

C-3-2.Determination of Sulphates in water sample.

C-3-3. Detemination of Flourides of water sample

17CE71 – ENVIRONMENTAL ENGINEERING LAB

Course Instructor: Dr. V. RAMAKRISHNA B.Tech(VI Sem)

P.KEERTHI A.Y 2021-22

Batch-A

Tentative Date/Batch	Actual date	A1	A2	A3	A4	A5	A6
21.02.2022		Introduction	Introduction	Introduction	Introduction	Introduction	Introduction
28.02.2022		C-1-1 C-1-2	C-1-1 C-1-2	C-1-3 C-1-4	C-1-3 C-1-4	C-1-5 C-1-6	C-1-5 C-1-6
07.03.2022		C-1-3 C-1-4	C-1-3 C-1-4	C-1-5 C-1-6	C-1-5 C-1-6	C-1-1 C-1-2	C-1-1 C-1-2
14.03.2022		C-1-5 C-1-6	C-1-5 C-1-6	C-1-1 C-1-2	C-1-1 C-1-2	C-1-3 C-1-4	C-1-3 C-1-4
21.03.2022		C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6
28.03.2022		C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-1
04.04.2022		C-2-3	C-2-4	C-2-5	C-2-6	C-2-1	C-2-2
18.04.2022		C-2-4	C-2-5	C-2-6	C-2-1	C-2-2	C-2-3
25.04.2022		C-2-5	C-2-6	C-2-1	C-2-2	C-2-3	C-2-4
02.05.2022		C-2-6	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5
09.05.2022		C-3-1	C-3-1	C-3-2	C-3-2	C-3-3	C-3-3
16.05.2022		C-3-2	C-3-2	C-3-3	C-3-3	C-3-1	C-3-1
23.05.2022		C-3-3	C-3-3	C-3-1	C-3-1	C-3-2	C-3-2
30.05.2022		REVISION					

17CE71 – ENVIRONMENTAL ENGINEERING LAB

Course Instructor: Dr. V. RAMAKRISHNA B.Tech(VI Sem)

P.KEERTHI A.Y 2021-22

Batch-B

Date/Batch	Actual date	B1	B2	B3	B4	B5	B6
23.02.2022		Introduction	Introduction	Introduction	Introduction	Introduction	Introduction
02.03.2022		C-1-1 C-1-2	C-1-1 C-1-2	C-1-3 C-1-4	C-1-3 C-1-4	C-1-5 C-1-6	C-1-5 C-1-6
09.03.2022		C-1-3 C-1-4	C-1-3 C-1-4	C-1-5 C-1-6	C-1-5 C-1-6	C-1-1 C-1-2	C-1-1 C-1-2
16.03.2022		C-1-5 C-1-6	C-1-5 C-1-6	C-1-1 C-1-2	C-1-1 C-1-2	C-1-3 C-1-4	C-1-3 C-1-4
23.03.2022		C-2-1	C-2-2	C-2-3	C-2-4	C-2-5	C-2-6
30.03.2022		C-2-2	C-2-3	C-2-4	C-2-5	C-2-6	C-2-1
06.04.2022		C-2-3	C-2-4	C-2-5	C-2-6	C-2-1	C-2-2
20.04.2022		C-2-4	C-2-5	C-2-6	C-2-1	C-2-2	C-2-3
27.04.2022		C-2-5	C-2-6	C-2-1	C-2-2	C-2-3	C-2-4
04.05.2022		C-2-6	C-2-1	C-2-2	C-2-3	C-2-4	C-2-5
11.05.2022		C-3-1	C-3-1	C-3-2	C-3-2	C-3-3	C-3-3
18.05.2022		C-3-2	C-3-2	C-3-3	C-3-3	C-3-1	C-3-1
25.05.2022		C-3-3	C-3-3	C-3-1	C-3-1	C-3-2	C-3-2
01.06.2022		REVISION					

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Course Instructor	Course Coordinator	Module Coordinator	HOD
(P.KEERTHI)	(P.KEERTHI)	(J RANGAIAH)	(Dr.V.RAMAKRISHNA)