



**LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING
(AUTONOMOUS)**

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada
L.B. REDDY NAGAR, MYLAVARAM, KRISHNA DIST., A.P.-521 230.

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

**COURSE HANDOUT
PART-A**

Name of Course Instructor : J.RANGAIAH

Course Name & Code : MECHANICS OF FLUIDS (20CE05)

Regulation: R20

L-T-P Structure : 3-0-0

Credits: 3

Program/Sem/Sec : II B.TECH., / I SEM

A.Y.: 2022-23

Pre-requisites: Applied Mechanics

Course Educational Objective: The course teaches the fluid properties and fundamental relations based on conservation of mass, energy and momentum in fluid flow. Applications of these basic equations are highlighted for flow measurements through orifice meter, venturi meter, Pitot tube, notches etc. Energy losses and Dimensional analysis are also discussed along with applications.

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

CO1	Understand the basic properties of fluids, and fundamental aspects of fluid mechanics such as pressure, types of flow, conservation of mass, energy, momentum, energy losses, dimensionless numbers & model laws (Understand – L2)
CO2	Determine the pressure at a point using pressure measuring devices and by applying hydrostatic pressure principles, and compute center of pressure for thee given conditions. (Apply-L3)
CO3	Determine the flow parameters using Continuity equation, Bernoulli equation and compute the forces acting on pipe bends. (Apply – L3)
CO4	Compute the energy losses in pipes and estimate the flow parameters in viscous flows using Hagen – Poiseuille equation. (Apply – L3)
CO5	Apply dimensional analysis as a tool in solving problems in the field of fluid mechanics and apply the laws of similarity. (Apply – L3)

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

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

TEXT BOOKS

1. R.K. Bansal, "A Textbook of Fluid Mechanics and Hydraulic Machines", Laxmi Publications (p) Ltd.
2. R.K. Rajput "Textbook of Fluid Mechanics and Hydraulic Machinery", Revised edition, S. Chand & Company, Ltd., New Delhi, 2005.

REFERENCES

1. K.R. Arora, "Fluid Mechanics, Hydraulic and Hydraulic Machines", Standard Publishers and Distributors, New Delhi, 2005.
2. A.K. Jain, Fluid Mechanics 2nd edition, Khanna Publishers, Delhi.2001 revised edition, Standard Book Home, New Delhi, 2005.
3. P.N. Modi, and S.M. Seth, "Hydraulics and Fluid Mechanics including Hydraulic Machines", Rajson Publications Pvt Ltd., Standard Book House, New Delhi, 2009.

PART-B**COURSE DELIVERY PLAN (LESSON PLAN)****UNIT – I: PROPERTIES OF FLUIDS**

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Basic Properties	1	12-09-2022		TLM1	
2.	Viscosity	1	14-09-2022		TLM1	
3.	Problems	1	15-09-2022		TLM1	
4.	Tutorial	1	17-09-2022		TLM3	
5.	Types of fluids, Surface Tension, Compressibility	1	19-09-2022		TLM1	
6.	Capillarity - Problems	1	21-09-2022		TLM1	
7.	Fluid Pressure Basics	1	22-09-2022		TLM1	
8.	Differential manometer	1	24-09-2022		TLM1	
9.	Problems	1	28-09-2022		TLM1	
10.	Inverted manometer	1	29-09-2022		TLM1	
11.	Tutorial	1	01-10-2022		TLM3	
12.	Problems	1	06-10-2022		TLM1	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: FLUID STATICS AND KINEMATICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
13.	HSF on vertical surfaces	1	10-10-2022		TLM1	
14.	Problems	1	12-10-2022		TLM1	
15.	HSF on inclined surfaces	1	13-10-2022		TLM1	
16.	Tutorial	1	15-10-2022		TLM3	
17.	HSF on horizontal surfaces	1	17-10-2022		TLM1	
18.	Fluid Kinematics: Types of flow	1	19-10-2022		TLM1	

19.	Continuity Equation	1	20-10-2022		TLM1	
20.	Velocity potential, Stream function	1	22-10-2022		TLM1	
21.	Rotational flows	1	26-10-2022		TLM1	
22.	Tutorial	1	27-10-2022		TLM3	
23.	Problems	1	29-10-2022		TLM1	
No. of classes required to complete UNIT-II: 11				No. of classes taken:		

UNIT- III: FLUID DYNAMICS

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
24.	Bernoulli equation	1	31-10-2022		TLM1	
25.	Problems	1	02-11-2022		TLM1	
26.	Venturimeter	1	03-11-2022		TLM1	
27.	Problems	1	05-11-2022		TLM1	
28.	Orifice meter	1	14-11-2022		TLM1	
29.	Pitot tube	1	16-11-2022		TLM1	
30.	Problems	1	17-11-2022		TLM3	
31.	Tutorial	1	19-11-2022		TLM1	
32.	Impulse Momentum Equation	1	21-11-2022		TLM1	
33.	Problems	1	23-11-2022		TLM1	
34.	Flow over notches	1	24-11-2022		TLM1	
35.	Tutorial	1	26-11-2022		TLM3	
No. of classes required to complete UNIT-III: 12				No. of classes taken:		

UNIT- IV: ENERGY LOSSES AND CLOSED CONDUIT FLOW

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
36.	Reynolds experiment	1	28-11-2022		TLM1	
37.	Fluid friction-Darcy's law	1	30-11-2022		TLM1	
38.	Problems	1	01-12-2022		TLM1	
39.	Minor losses	1	03-12-2022		TLM1	
40.	Pipes in series, parallel	1	05-12-2022		TLM1	
41.	Problems	1	07-12-2022		TLM1	
42.	Tutorial	1	08-12-2022		TLM3	
43.	Total energy line and HGL	1	10-12-2022		TLM1	
44.	Laminar flow-HP equation	1	12-12-2022		TLM1	
45.	Tutorial	1	14-12-2022		TLM3	
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: DIMENSIONAL ANALYSIS AND HYDRAULIC SIMILITUDE

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
46.	Dimensional analysis - Applications	1	15-12-2022		TLM1	
47.	Rayleigh method	1	17-12-2022		TLM1	
48.	Problems	1	19-12-2022		TLM1	
49.	Buckingham method	1	21-12-2022		TLM1	
50.	Problems	1	22-12-2023		TLM1	
51.	Tutorial	1	24-12-2023		TLM3	
52.	Dimensionless numbers	1	26-12-2023		TLM1	
53.	Hydraulic similarities	1	28-12-2023		TLM1	
54.	Model laws	1	29-12-2023		TLM1	
55.	Tutorial	1	31-12-2023		TLM3	
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

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

PART-C

EVALUATION PROCESS (R20 Regulation):

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

PART-D

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	J.Rangaiah	J.Rangaiah	J.Rangaiah	Dr.V.Ramakrishna
Signature				



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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 : B NARASIMHARAO
Course Name & Code : ENGINEERING GEOLOGY &20CE08
L-T-P Structure : 3-0-0 Credits : 3
Program/Sem/Sec : B.Tech., CE., III-Sem., A.Y : 2022-23

PRE-REQUISITE:NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs):The course introduces the concepts of Geology in civil engineering perspective. The student is exposed to properties of different minerals and rocks. The importance of structural geological features and geophysical principles will be addressed for their interpretation in civil engineering designs.

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

CO 1	Understand and interpret fundamental geological processes and geological formations.(L2-Understand)
CO 2	Differentiate various properties of minerals and rocks. (L2-Understand)
CO 3	Illustrate geological structural features. (L3-Apply)
CO 4	Apply geological principles in civil engineering applications. (L3-Apply)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO2	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO3	1	-	-	-	-	-	-	-	-	-	-	1	-	-	-
CO4	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 Parbin Singh., “Engineering and General Geology”, Katson Publication House, 2009.
T2 ChennaKesavulu N., “Text book of Engineering Geology”, Macmillan India Ltd, 2003.

REFERENCE BOOKS:

- R1 Legget., “Geology and Engineering”, 2nd Edition, McGraw Hill Boom Company, 2006.
R2 Blyth. “Geology for Engineers”, 7th Edition, ELBS, 1995.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT –I: GENERAL GEOLOGY

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 engineering geology	1	12-09-2022		TLM2	
2.	Geology in civil engineering	1	14-09-2022		TLM2	
3.	Branches of geology	1	15-09-2022		TLM2	
4.	Earth structure	1	16-09-2022		TLM2	
5.	Earth composition	1	19-09-2022		TLM2	
6.	Continental drift	1	21-09-2022		TLM2	
7.	Plate tectonics	1	22-09-2022		TLM2	
8.	Weathering- types and products	1	23-09-2022		TLM2	
9.	Soil profile	1	26-09-2022		TLM2	
10.	Geological work of rivers, wind and sea	1	28-09-2022		TLM2	
11.	Seismic zones of India	1	29-09-2022		TLM2	
12.	REVISION	1	30-09-2022		TLM2	
No. of classes required to complete UNIT-I:11				No. of classes taken:		

UNIT-II: MINEROLOGY

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 minerology	1	06-10-2022		TLM2	
2.	Physical properties of minerals	1	07-10-2022		TLM2	
3.	Quartz group minerals	1	10-10-2022		TLM2	
4.	Feldspar group minerals	1	12-10-2022		TLM2	
5.	Pyroxene group minerals	1	13-10-2022		TLM2	
6.	Amphibole group minerals	1	14-10-2022		TLM2	
7.	Mica group minerals	1	17-10-2022		TLM2	
8.	Calcite group minerals	1	19-10-2022		TLM2	
9.	Gypsum group minerals	1	20-10-2022		TLM2	
10.	Clay group minerals	1	21-10-2022		TLM2	
11.	REVISION	1	26-10-2022		TLM2	
No. of classes required to complete UNIT-II:10				No. of classes taken:		

UNIT-III: PETROLOGY

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 of petrology	1	27-10-2022		TLM2	
2.	Geological classification of rocks-Igneous	1	28-10-2022		TLM2	
3.	Sedimentary and Metamorphic rocks	1	31-10-2022		TLM2	
4.	Physical classification of rocks	1	02-11-2022		TLM2	
5.	Chemical classification of rocks	1	03-11-2022		TLM2	
6.	Physical properties of rocks	1	04-11-2022		TLM2	
7.	Physical properties of rocks	1	14-11-2022		TLM2	
8.	Occurrence of Importance of rocks	1	16-11-2022		TLM2	
9.	Granite, Diorite, Dolerite, Gabbro	1	17-11-2022		TLM2	

10.	Basalt, Limestone, Conglomerate, Breccia	1	18-11-2022		TLM2
11.	Sand stone, Quartzite, Marble, Gneiss and Schist etc.,	1	21-11-2022		TLM2
12.	REVISION	1	23-11-2022		TLM2
No. of classes required to complete UNIT-III:11				No. of classes taken:	

UNIT- IV: STRUCTURAL GEOLOGY

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 structural geology	1	24-11-2022		TLM2	
2.	Dip and strike in structural geology	1	25-11-2022		TLM2	
3.	Classification and types of folds and Faults	1	28-11-2022		TLM2	
4.	Relevance of Folds	1	30-11-2022		TLM2	
5.	Importance of Folds	1	01-12-2022		TLM2	
6.	Relevance of Faults	1	02-12-2022		TLM2	
7.	Importance of Faults	1	05-12-2022		TLM2	
8.	Classification and types of Unconformities and Joints	1	07-12-2022		TLM2	
9.	Relevance of Unconformities and Joints	1	08-12-2022		TLM2	
10.	Importance of Unconformities and Joints	1	09-12-2022		TLM2	
11.	REVISION	1	12-12-2022		TLM2	
No. of classes required to complete UNIT-IV:10				No. of classes taken:		

UNIT-V:ENGINEERING APPLICATIONS IN GEOLOGY

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.	Importance of Geophysical studies	1	14-12-2022		TLM2	
2.	Introduction of principles of Geophysical studies	1	15-12-2022		TLM2	
3.	Gravity method	1	16-12-2022		TLM2	
4.	Magnetic method	1	19-12-2022		TLM2	
5.	Electrical methods	1	21-12-2022		TLM2	
6.	Seismic methods	1	22-12-2022		TLM2	
7.	Radio metric methods	1	23-12-2022		TLM2	
8.	Geothermal methods	1	26-12-2022		TLM2	
9.	Geological considerations in Dams and Reservoirs	1	28-12-2022		TLM2	
10.	Geological considerations in Tunnel	1	29-12-2022		TLM2	
11.	REVISION	1	30-12-2022		TLM2	
No. of classes required to complete UNIT-V:10				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=15
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=15
II-Quiz Examination (Units-III, IV & V)	Q2=10
Assignment Marks = Best Four Average of A1, A2, A3, A4, A5	A=5
CIE-I (Mid-I, Assignment-I, Quiz-I)	30
CIE-II (Mid-II, Assignment-II, Quiz-II)	30
Cumulative Internal Examination (CIE):75% best and 25% least	30
Semester End Examination (SEE)	70
Total Marks = CIE + SEE	100

PART-D

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor
(B NARASIMHARAO)

Course Coordinator
(B NARASIMHARAO)

Module Coordinator
(J RANGAIAH)

HOD
(Dr. V.RAMAKRISHNA)



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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Dr. Shaheda Niloufer
Course Name & Code : Environmental Science & 20MC03
L-T-P Structure : 2-0-0 Credits : 0
Program/Sem/Sec : B.Tech., CIVIL., III-Sem. A.Y : 2021-22

PRE-REQUISITE:

COURSE EDUCATIONAL OBJECTIVES (CEOs): The purpose of this course is to provide a general background on developing an understanding of systems and cycles on the earth and how individual organisms live together in complex communities and how human activities influence our air, water and soil. It also helps in developing an understanding about our use of fossil fuels and effect on climate and sustainable management of natural resources.

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

CO 1	Identify environmental problems arising due to engineering and technological activities that help to be the part of sustainable solutions.
CO 2	Evaluate local, regional and global environmental issues related to resources and their sustainable management.
CO 3	Realize the importance of ecosystem and biodiversity for maintaining ecological balance.
CO 4	Acknowledge and prevent the problems related to pollution of air, water and soil.
CO5	Identify the significance of implementing environmental laws and abatement devices for environmental 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	3	3	-	-	-	3	3	3	-	-	-	3	-	-	-
CO2	3	3	-	-	-	3	3	-	-	-	-	3	-	-	-
CO3	3	-	3	-	-	-	2	-	-	-	-	2	-	-	-
CO4	3	-	-	-	-	2	3	2	-	-	-	3	-	-	-
CO5	3	3	3	3	-	3	3	3	-	-	-	3	-	-	-

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** Anubha Kaushik, C.P.Kaushik, "Perspectives in Environmental Studies", New age international publishers, 5th Edition, Delhi, 2016.
- T2** Mahua Basu, S. Xavier, "Fundamentals of Environmental Studies", Cambridge University Press, 1st Edition, Delhi, 2016.

REFERENCE BOOKS:

- R1** S. Deswal, A. Deswal, "A Basic course in Environmental Studies", Educational & Technical Publishers, 2nd Edition, Delhi, 2014.
- R2** R. Rajagopalan, "Environmental Studies (From Crisis to Cure)", Oxford University Press,

2nd Edition, New Delhi, 2012.

- R3** De, A.K, “Environmental Chemistry”, New Age International (P) Limited, 5th Edition, New Delhi, 2003.
- R4** Dr.K.V.S.G. Murali Krishna, “Environmental Studies”, VGS Techno Series, 1st Edition, Vijayawada, 2010.
- R5** G. Tyler Miller, Scott Spoolman, “Introduction to Environmental Studies”, Cengage Learning, 13th Edition, New Delhi, 2009.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: NATURE AND SCOPE OF ENVIRONMENTAL PROBLEMS

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 of course and course objectives. Introduction of components of Environment	1	14-09-2022		2	
2.	Population explosion and variations among Nations.	1	16-09-2022		2	
3.	Resettlement and Rehabilitation - Issues and possible solutions	1	21-09-2022		2	
4.	Environmental Hazards	1	23-09-2022		2	
5.	Role of Information Technology in environmental management and human health.	1	28-09-2022		2	
No. of classes required to complete UNIT-I: 5				No. of classes taken:		

UNIT-II: NATURAL RESOURCES AND CONSERVATION

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 classification of Natural resources, Forest Resources,	1	30-10-2022		2	
2.	Water Resources	1	12-10-2022		2	
3.	Mineral Resources	1	14-10-2022		2	
4.	Food Resources	1	19-10-2022		2	
5.	Food Resources	1	21-10-2022		2	
6.	Mineral Resources	1	26-10-2022		2	
No. of classes required to complete UNIT-II: 6				No. of classes taken:		

UNIT-III: ECOLOGY AND BIODIVERSITY

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.	Definition, structure and functions of an ecosystem	1	28-10-2022		2	
2.	Food chains and Food webs, Ecological succession, Ecological pyramids, Bio-geo-chemical cycles	1	02-11-2022		2	
3.	Major Types of Ecosystems – Forest, Grassland, Desert Land & aquatic Ecosystem, Ecological Niche and Keystone Species, Bio-geographical classification of		04-11-2022			

	India. India as a mega diversity nation				
4.	I MID EXAMINATION	1	09-11-2022		2
5.	I MID EXAMINATION		11-11-2022		
6.	Values of biodiversity- Direct and Indirect values. Threats to biodiversity; Assignment in Unit II	1	16-11-2022		2
7.	Man and wild life conflicts. Endangered and endemic species of India	1	18-11-2022		2,3
8.	Conservation of biodiversity: In-situ and Ex-situ conservation methods	1	23-11-2022		2
No. of classes required to complete UNIT-III: 6				No. of classes taken:	

UNIT-IV : ENVIRONMENTAL 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.	Air Pollution	1	25-11-2022		2	
2.	Causes, effects and control measures of: Water Pollution	1	30-11-2022		2	
3.	Causes, effects and control measures of: Soil Pollution,		02-12-2022		2	
4.	Noise Pollution		07-12-2022		2	
5.	Solid Waste Management	1	09-12-2022		2,3	
6.	Disaster Management- Floods, Cyclones, Earthquakes, Landslides and Tsunamis.	1	14-12-2022		2	
No. of classes required to complete UNIT-IV: 6				No. of classes taken:		

UNIT-V : ENVIRONMENTAL 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.	Sustainable Development	1	16-12-2022		2	
2.	Climate disruption- Greenhouse effect, ozone layer depletion and acid rain. Stockholm conference	1	21-12-2022		2,3	
3.	Environmental Impact Assessment (EIA)		23-12-2022		2	
4.	Green building, Environmental Law		28-12-2022		2	
5.	Revision	1	30-12-2022		2	
6.	II MID EXAMINATIONS		04-01-2023			
7.	II MID EXAMINATIONS	1	06-01-2023			
No. of classes required to complete UNIT-V: 05				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
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PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. Shaheda Niloufer	Dr. A. Rami Reddy
Signature				



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Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: K. HARISH KUMAR

Course Name & Code : CONCRTEE TECHNOLOGY & 20CE07

L-T-P Structure : 3-0-0

Credits: 3

Program/Sem/Sec : B.Tech, III SEM

A.Y.: 2022-23

PREREQUISITE: Building Materials

COURSE EDUCATIONAL OBJECTIVES (CEOs): The course aims to teach the basic properties of concrete making materials, various tests on concrete and different admixtures to be used in concrete. The course also provides insight on various types of special concrete and their usage, determination of mix proportions as per IS codes.

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

CO1	Understand the basic ingredients of concrete, their role in the production of concrete and its behavior in the field. (Understand-L2)
CO2	Differentiate the fresh and hardened properties of concrete. (Understand-L2)
CO3	Describe the main operations of concreting i.e., selection of materials and its proportional mixing towards mixing, placing, compaction, curing and finishing. (Understand-L2)
CO4	Perceiving & broadening the knowledge of new concrete types and concrete mix design methods. (Understand-L2)

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

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

TEXTBOOKS:

- T1** M.S. Shetty, "Concrete Technology" S. Chand & Co., Ltd., Revised Edition - New Delhi, 2003.
- T2** Rangwala "Engineering Materials (Material science)" Charotar Publishing House Pvt Ltd., Edition-2012.
- T3** M.L. Gambhir, "Concrete Technology", Revised Edition - Tata McGraw Hill Publishing Co., New Delhi 1998.

REFERENCE BOOKS:

- R1** B.C. Punmia, Ashok Kumar Jain and Arun Kumar Jain. "Building Construction"- Laxmi Publications (P) Ltd.
- R2** K.T. Krishnaswamy, "Concrete Technology" Dhanpat Rai Publications.

CODE BOOK: IS 10262-2019 "Concrete Mix Design"

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: CONCRETE MAKING 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.	Introduction CO's & PO's, Subject	1	12.09.2022		TLM2	
2.	Portland cement –Chemical composition	1	13.09.2022		TLM2	
3.	Hydration & types of cement	1	16.09.2022		TLM2	
4.	Cement tests and specifications	1	17.09.2022		TLM2	
5.	Classification of aggregate –gradation of aggregate	1	19.09.2022		TLM2	
6.	fineness modulus – Bulking of sand	1	20.09.2022		TLM1	
7.	Tutorial -1	1	23.09.2022		TLM3	
8.	Aggregate tests and specifications	1	24.09.2022		TLM2	
9.	Alkali aggregate reaction-Quality of mixing water	1	26.09.2022		TLM2	
10.	Test – 1/ Assignment	1	27.09.2022		TLM3	
No. of classes required to complete UNIT-I: 10				No. of classes taken:		

UNIT-II: PROPERTIES OF CONCRETE

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
11.	Properties of fresh concrete –workability	1	30.09.2022		TLM2	
12.	Tests- slump, compaction factor, flow test, vee bee consistometer, Kelly ball	2	01.10.2022 10.10.2022		TLM2	
13.	segregation – bleeding of concrete	1	11.10.2022		TLM2	
14.	Properties of hardened concrete-Water / Cement ratio – Abram's Law	1	14.10.2022		TLM2	
15.	Gel space ratio –strength development	1	15.10.2022		TLM2	
16.	elastic properties of concrete	1	17.10.2022		TLM2	
17.	Tutorial -2	1	18.10.2022		TLM3	
18.	Durability and thermal properties	1	21.10.2022		TLM2	
19.	Creep and Shrinkage -types of shrinkage	1	22.10.2022		TLM2	
20.	Test – 2/ Assignment	1	25.10.2022		TLM3	
No. of classes required to complete UNIT-II:11				No. of classes taken:		

UNIT-III: QUALITY CONTROL AND ADMIXTURES IN CONCRETE

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
21.	Introduction - Quality Control of concrete	2	28.10.2022 29.10.2022		TLM2	
22.	techniques –batching –mixing – placing-	2	31.10.2022 01.11.2022		TLM2	
23.	transporting --compacting –finishing-curing	2	04.11.2022 05.11.2022		TLM2	
	MID – I Exams		07.11.2022 12.11.2022			
24.	Admixtures- Accelerators – retarders –	2	14.11.2022		TLM2	

	plasticizers- super plasticizer		15.11.2022		
25.	Admixtures- air entraining agents- workability agents -bonding admixtures	1	18.11.2022		TLM2
26.	Mineral admixtures – silica fume	1	19.11.2022		TLM2
27.	fly ash –blast furnace slag	1	21.11.2022		TLM2
28.	Tutorial -3	1	22.11.2022		TLM3
29.	Test – 3/ Assignment	1	25.11.2022		
No. of classes required to complete UNIT-III:12				No. of classes taken:	

UNIT-IV: SPECIAL CONCRETES

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
30.	Light weight concrete – lightweight aggregate concrete -no fines concrete	2	26.11.2022 28.11.2022		TLM2	
31.	high density concrete – Sulphur infiltrated concrete -fiber reinforced concrete	2	29.11.2022 02.12.2022		TLM2	
32.	polymer concrete -ready mixed concrete	1	03.12.2022		TLM2	
33.	high strength concrete –High performance concrete- Self compacting concrete	1	05.12.2022		TLM2	
34.	Bacterial concrete –Shotcrete	1	06.12.2022		TLM2	
35.	prepacked concrete-Ferrocement	1	09.12.2022		TLM2	
36.	Tutorial -4	1	12.12.2022		TLM3	
37.	Test – 4/ Assignment	1	13.12.2022			
No. of classes required to complete UNIT-IV: 10				No. of classes taken:		

UNIT-V: MIX DESIGN

S. No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
38.	Concept of mix design – objects of mix design	1	16.12.2022		TLM2	
39.	Factors in the choice of mix proportions	1	17.12.2022		TLM2	
40.	Introduction to different methods of mix design	1	19.12.2022		TLM1	
41.	concrete mix design by I. S method	2	20.12.2022 23.12.2022		TLM1	
42.	Fly ash concrete mix design by I. S method	2	24.12.2022 26.12.2022		TLM1	
43.	Tutorial -5	1	27.12.2022		TLM3	
44.	Test – 5/ Assignment	1	30.12.2022		TLM3	
45.	Revision	1	31.12.2022		TLM2	
	MID – II Exams		02.01.2023 07.01.2023			
	Preparation and Practical		09.01.2023 14.01.2023			
	Semester End Examination		16.01.2023 28.01.2023			
No. of classes required to complete UNIT-V: 10				No. of classes taken:		

Teaching Learning Methods

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

PART-C

EVALUATION PROCESS (R17 Regulation):

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

PART-D

PROGRAMME OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modeling to complex engineering activities with an understanding of the limitations
PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

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



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

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor	: V.Sankararao	
Course Name & Code	: SOLID MECHANICS & 20CE06	
L-T-P Structure	: 3-1-0	Credits : 3
Program/Sem/Sec	: B.Tech., CE., III-Sem.,	A.Y : 2022-23
PRE-REQUISITE	: Applied Mechanics	

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

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

CO 1	Recall the terminology associated with the structural members viz. bars, beams, column, shafts which are subjected to practical loads. (Remember-L1)
CO 2	Relate the required input parameters for finding the reactions / internal forces in the structural elements subjected to axial, shear, bending and torsional forces (Understand-L2)
CO 3	Solve for the axial, shear, bending and twisting moment in columns/ Beams/ Shafts/ subjected to longitudinal, transverse and twisting loads and their combinations.(Apply-L3)
CO 4	Construct the shear, bending moment and stress variation diagrams at every cross section along the length of determinate structures subjected to applied loads. (Apply-L3)
CO5	Identify the maximum values of stresses/ moments in structural members of various cross sections subjected to axial/ transverse/ torsional loads. (Apply-L3)

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

COs	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
C01	1											1			1
C02	2											2			2
C03	3											3			2
C04	3											3			2
C05	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).

TEXT BOOKS

T1 R.K.Bansal, "Introduction to Strength of Materials", Laxmi publications, 6th edition, 2018.

T2 Punmia. B. C., Jain, A. K. Jain. "Strength of Materials and Theory of Structures", Vols. I & II", 9th Edition, Laxmi Publications (P) Ltd, New Delhi, 2004.

REFERENCES

R1 Bhavikatti. S. S., "Strength of Materials", Vikas Publishing House (P) Ltd., New Delhi, Third Edition, 2013

R2 Gere and Timoshenko. "Mechanics of Materials", 6th, PWS Publishing Company, 2009

R3 R.K.Rajput, "Mechanics of Structures", S. Chand Publication Revised Edition, 2007.

PART-B

COURSE DELIVERY PLAN (LESSON PLAN):

UNIT-I: SIMPLE STRESSES AND STRAINS:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Solid Mechanics	1	12-09-2022		1	
2.	Mechanical Properties of	1	13-09-2022		1	
3.	Types of stresses and strains	1	14-09-2022		1	
4.	Stress strain diagram and salient features	1	15-09-2022		1	
5.	Problems on Stress strain Relationship	1	19-09-2022		1	
6.	Analysis of Varying bars	1	20-09-2022		1	
7.	Problems on Compound bars	1	21-09-2022		1	
8.	Relation between Elastic constants	1	22-09-2022		1	
9.	Temperature stresses	1	26-09-2022		1	
10.	Problems on Temperature stresses	1	27-09-2022		1	
11.	Strain energy concept	1	28-09-2022		1,2	
12.	Problems on strain energy	1	29-09-2022		1,2	
No. of classes required to complete UNIT-I: 12				No. of classes taken:		

UNIT-II: PRINCIPAL STRESSES AND STRAINS:

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction to Principal Stresses	1	10-10-2022		1	
2.	Stresses on inclined plane-Uniaxial stress system	1	11-10-2022		1	
3.	Stresses on inclined plane-Biaxial & pure shear stress	1	12-10-2022		1	
4.	Stresses on inclined plane-Complex stress system	1	13-10-2022		1	
5.	Principal stresses and planes	1	17-10-2022		1	
6.	Construction of Mohr's circle	1	18-10-2022		1,2	
7.	Determination of Principal stresses and planes	1	19-10-2022		1,2	
8.	Determination of Stresses on inclined plane	1	20-10-2022		1	
No. of classes required to complete UNIT-II: 8				No. of classes taken:		

UNIT-III: SHEAR FORCE AND BENDING MOMENT & FLEXURAL STRESSES

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Types of beams and loads on beams	1	25-10-2022		1,2	
2.	Reactions in SS beam with elementary loads	1	26-10-2022		1	
3.	SFD and BMD in SS beam with elementary loading	1	27-10-2022		1	
4.	SFD and BMD in Cantilever beam with elementary	1	31-10-2022		1	
5.	SFD and BMD of SS beam with combined loading	1	01-11-2022		1	
6.	Relation B/W shear force loading and BMD- Loading and BMD from SFD	1	02-11-2022		1	
7.	Pure bending equation derivation	1	03-11-2022		1	
I MID Examinations 07-11-2022 to 12-11-2022						
8.	Finding bending stress in Rectangular section	1	14-11-2022		1	
9.	Finding bending stress in I,T section	1	15-11-2022		1	
10.	Design of simple beam for bending	1	16-11-2022		1	
11.	Problems	1	17-11-2022		1	
No. of classes required to complete UNIT-III: 11				No. of classes taken:		

UNIT-IV: Shear Stresses & Torsion of Circular Shafts

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.	Horizontal shear stress derivation	1	21-11-2022		1,2	
2.	Horizontal shear stress in Rec. sec	1	22-11-2022		1,2	
3.	Horizontal shear stress in Circular and Triangular sec	1	23-11-2022		1	
4.	Horizontal shear stress in I section	1	24-11-2022		1	
5.	Torsion formula Derivation	1	28-11-2022		1	
6.	Problems on finding shear stress in shafts	1	29-11-2022		1	
7.	Problems on finding power transmitted in shafts	1	30-11-2022		1	
8.	Problems on design of shaft diameter	1	01-12-2022		1	
9.	Combined bending and Torsion	1	05-12-2022		1,2	
10.	Problems	1	06-12-2022		1	
11.	Problems	1	07-12-2022		1	
No. of classes required to complete UNIT-V:11				No. of classes taken:		

UNIT-V: Columns & Direct and Bending Stresses

S.No.	Topics to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Terminology in columns and Euler's long column	1	08-12-2022		1,2	
2.	Critical load for both ends hinged and fixed support conditions of columns	1	12-12-2022		1,2	
3.	Critical load for one end hinged/free and other end fixed	1	13-12-2022		1,2	
4.	Empirical formulae in Columns	1	14-12-2022		1,2	
5.	Introduction to direct and bending stresses	1	15-12-2022		1,2	
6.	Stresses due to eccentric loading in columns	1	19-12-2022		1	
7.	Core of section in rectangular and circular sections	1	20-12-2022		1	
8.	Determination of stresses in the case of chimneys	1	21-12-2022		1	
9.	Determination of stresses in the case of dams	1	22-12-2022		1	
10.	Problems	1	26-12-2022		1	
11.	Determination of stresses in the case of retaining walls	1	27-12-2022		1	

12.	Problems	1	28-12-2022		1
13.	Review on Unit V	1	29-12-2022		1

II MID Examinations 02-01-2023 to 07-01-2023

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

No. of classes taken:

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

PART-C

EVALUATION PROCESS (R20Regulations):

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

PART-D

PROGRAMME

OUTCOMES (POs):

PO 1	Engineering knowledge: Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	Problem analysis: Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	Design/development of solutions: Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	Conduct investigations of complex problems: Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	Modern tool usage: Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations

PO 6	The engineer and society: Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice
PO 7	Environment and sustainability: Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO 8	Ethics: Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	Individual and team work: Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	Communication: Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	Project management and finance: Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Signature				
Name of the Faculty	Mr. V.Sankararao	Mr. K.V.Viswanadh	Mr.B.Sudheer Kumar	Dr.S.Pichi Reddy
	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

Accredited by NAAC & NBA (Under Tier - I), ISO 9001:2015 Certified Institution

Approved by AICTE, New Delhi. and Affiliated to JNTUK, Kakinada

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

Phone: 08659-222933, Fax: 08659-222931

DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor: B. NARASIMHARAO

Course Name & Code : ENGINEERING GEOLOGY LAB & 20CE56

Regulation:R20

L-T-P Structure : 0-0-3

Credits: 1.5

Program/Sem/Sec : II B.Tech., I sem

A.Y.: 2021-22

PREREQUISITE : NIL

COURSE EDUCATIONAL OBJECTIVES (CEOs): The laboratory course is intended to impart skills in identifying minerals and rocks based on physical properties. Through these practical sessions a student is equipped to interpret geological structural features in civil engineering perspective.

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

CO1	Demonstrate the importance of geological principles. (Understand-L2)
CO2	Distinguish various types of minerals and rocks based on physical properties and physical observations. (Understand-L2)
CO3	Interpret structural patterns of various geological structures. (Understand-L2)

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

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

TEXTBOOKS/REFERENCE BOOKS:

Laboratory manual developed by Civil Engineering Department

ENGINEERING GEOLOGY LAB—20CE56

LIST OF EXPERIMENTS

COURSE: III SEMESTER

A.Y: 2022-23

I CYCLE

1. Description of minerals by physical properties.
2. Identify the given mineral properties: Augite, Aragonite, Actinolite, Asbestos, Barite.
3. Identify the given mineral properties: Bauxite, Beryl, Biotite, Calcite, Corundum.
4. Identify the given mineral properties: Chalcopyrite, Dolomite, Epidote, Feldspar, Garnet.
5. Identify the given mineral properties: Galena, Gypsum, Hornblende, Hyperstrene, Jasper.
6. Identify the given mineral properties: Kynite, Muscovite, Nephelene, Olivine, Manganese ore .

II CYCLE

1. Identify the given mineral properties: Quartz, Steatite, Serpentine, Stilbite, Talc.
2. Study of Igneous Type of Rocks.
3. Study of Sedimentary Type of Rocks.
4. Study of Metamorphic Type of Rocks.
5. Microscopic study of Minerals and Rocks.
6. Fractures Interpretation in geological maps.

Lab-In charge

Head of the Department

ENGINEERING GEOLOGY LAB--17CE56

COURSE: III SEMESTER

A.Y: 2022-23

I CYCLE SCHEDULE: BATCH-A

Exp / Date	I	II	III	IV	V	VI
13-09-2022	Demo	Demo	Demo	Demo	Demo	Demo
20-09-2022	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆
27-09-2022	A ₆	A ₁	A ₂	A ₃	A ₄	A ₅
11-10-2022	A ₅	A ₆	A ₁	A ₂	A ₃	A ₄
18-10-2022	A ₄	A ₅	A ₆	A ₁	A ₂	A ₃
25-10-2022	A ₃	A ₄	A ₅	A ₆	A ₁	A ₂
01-11-2022	A ₂	A ₃	A ₄	A ₅	A ₆	A ₁

I CYCLE SCHEDULE: BATCH-B

Exp / Date	I	II	III	IV	V	VI
17-09-2022	Demo	Demo	Demo	Demo	Demo	Demo
24-09-2022	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
01-10-2022	B ₆	B ₁	B ₂	B ₃	B ₄	B ₅
15-10-2022	B ₅	B ₆	B ₁	B ₂	B ₃	B ₄
22-10-2022	B ₄	B ₅	B ₆	B ₁	B ₂	B ₃
29-10-2022	B ₃	B ₄	B ₅	B ₆	B ₁	B ₂
05-11-2022	B ₂	B ₃	B ₄	B ₅	B ₆	B ₁

Lab-In charge

Head of the Department

ENGINEERING GEOLOGY LAB--17CE56**COURSE: III SEMESTER****A.Y: 2022-23****II CYCLE SCHEDULE: BATCH-A**

Exp/Date	I	II	III	IV	V	VI
15-11-2022	A ₁	A ₂	A ₃	A ₄	A ₅	A ₆
22-11-2022	A ₆	A ₁	A ₂	A ₃	A ₄	A ₅
29-11-2022	A ₅	A ₆	A ₁	A ₂	A ₃	A ₄
06-12-2022	A ₄	A ₅	A ₆	A ₁	A ₂	A ₃
13-12-2022	A ₃	A ₄	A ₅	A ₆	A ₁	A ₂
20-12-2022	A ₂	A ₃	A ₄	A ₅	A ₆	A ₁
27-12-2022	<i>INTERNAL</i>					

II CYCLE SCHEDULE: BATCH-B

Exp / Date	I	II	III	IV	V	VI
19-11-2022	B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
26-11-2022	B ₆	B ₁	B ₂	B ₃	B ₄	B ₅
03-12-2022	B ₅	B ₆	B ₁	B ₂	B ₃	B ₄
10-12-2022	B ₄	B ₅	B ₆	B ₁	B ₂	B ₃
17-12-2022	B ₃	B ₄	B ₅	B ₆	B ₁	B ₂
24-12-2022	B ₂	B ₃	B ₄	B ₅	B ₆	B ₁
31-12-2022	<i>INTERNAL</i>					

Lab-In charge**Head of the Department**

ENGINEERING GEOLOGY LAB--17CE56

COURSE: III SEMESTER

A.Y: 2022-23

BATCH: A	BATCH: B
A ₁ —20761A0107 & 21761A0101 to 21761A0105	B ₁ —21761A0133 to 21761A0138
A ₂ —21761A0106 to 21761A0110	B ₂ —21761A0139 to 21761A0144
A ₃ —21761A0111 to 21761A0115	B ₃ —21761A0145 to Lateral Entry 5
A ₄ —21761A0116 to 21761A0120	B ₄ — Lateral Entry 6 to Lateral Entry 11
A ₅ —21761A0121 to 21761A0125	B ₅ — Lateral Entry 12 to Lateral Entry 17
A ₆ —21761A0126 & 21761A0129 To 21761A0132	B ₆ — Lateral Entry 18 to Lateral Entry last number

Lab-In charge

Head of the Department

ENGINEERING GEOLOGY LAB -17CE56

COURSE: III SEMESTER

A.Y: 2022-23

LAB TIME -TABLE

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

Batch – A: 20761A0107 & 21761A0101 to 21761A0132

Batch – B: 21761A0133 to 21761A0145 and Lateral entry Students (LE's)

Lab-In charge

Head of the Department

PROGRAMME EDUCATIONAL OBJECTIVES (PEOs):

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

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	B Narasimharao	B Narasimharao	B Narasimharao	Dr. V. Ramakrishna
Signature				

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)
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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PROGRAM	: B.Tech, III-Sem., CIVIL
ACADEMIC YEAR	: 2022-23
COURSE NAME & CODE	: Building Materials and Concrete Technology Lab (20CE55)
L-T-P STRUCTURE	: 0-0-3
COURSE CREDITS	: 1.5
COURSE INSTRUCTOR	: Sri. K. Harish Kumar / Dr. JVR
COURSE COORDINATOR	: Sri. K. Harish Kumar
PRE-REQUISITE	: Concrete Technology, Building Materials

COURSE EDUCATIONAL OBJECTIVE:

The course aims to train the students in performing laboratory experiments to find the basic properties of bricks, tiles, cement, aggregates and concrete

COURSE OUTCOMES:

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

CO1 : Differentiate bricks and tiles based on physical properties

CO2 : Determine the properties of concrete making materials.

CO3 : Identify the properties of concrete

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	1			1			1			3	1	
CO2	3	3	3	1			1			1			3	1	
CO3	3	3	3	1			1			1			3	1	
CO4	3	3	3	1			1			1			3	1	

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

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

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DEPARTMENT OF CIVIL ENGINEERING

BUILDING MATERIALS AND CONCRETE TECHNOLOGY LAB (20CE55)

LIST OF EXPERIMENTS

COURSE: III SEMESTER

A.Y: 2022-2023

I CYCLE

7. Classification of bricks by determination of water absorption, shape test, soundness, warping, colour and compressive strength.
8. Determination of a) Normal Consistency of cement b) Fineness of cement using 90 microns IS sieve.
9. Determination of Initial and final setting time of cement.
10. Determination of a) Specific gravity of cement b) Soundness of cement
11. Determination of compressive strength of cement.
12. Determination of Bulking of fine aggregate

II CYCLE

7. Determination of fineness modulus of a) Fine aggregate b) Coarse aggregate.
8. Determination of Bulk density and specific gravity of a) Fine Aggregate b) Coarse Aggregate
9. Determination of workability of concrete by conducting slump cone test.
10. Determination of workability of concrete by conducting compaction factor test.
11. Determination of a) Cube compressive strength b) Split tensile strength of concrete.
12. Non- destructive test on concrete using Rebound Hammer/ Ultrasonic tester.

Lab-In charge

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BUILDING MATERIALS AND CONCRETE TECHNOLOGY LAB (20CE55)

COURSE: III SEMESTER

A.Y: 2022-23

I CYCLE SCHEDULE: BATCH-A (TUESDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V	VI
13/09/2022		Demo	Demo	Demo	Demo	Demo	Demo
20/09/2022		A ₁	A ₂	A ₃	A ₄	A ₅	A ₆
27/09/2022		A ₆	A ₁	A ₂	A ₃	A ₄	A ₅
11/10/2022		A ₅	A ₆	A ₁	A ₂	A ₃	A ₄
18/10/2022		A ₄	A ₅	A ₆	A ₁	A ₂	A ₃
25/10/2022		A ₃	A ₄	A ₅	A ₆	A ₁	A ₂
01/11/2022		A ₂	A ₃	A ₄	A ₅	A ₆	A ₁

I CYCLE SCHEDULE: BATCH-B (WEDNESDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V	VI
14/09/2022		Demo	Demo	Demo	Demo	Demo	Demo
21/09/2022		B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
28/09/2022		B ₆	B ₁	B ₂	B ₃	B ₄	B ₅
12/10/2022		B ₅	B ₆	B ₁	B ₂	B ₃	B ₄
19/10/2022		B ₄	B ₅	B ₆	B ₁	B ₂	B ₃
26/10/2022		B ₃	B ₄	B ₅	B ₆	B ₁	B ₂
02/11/2022		B ₂	B ₃	B ₄	B ₅	B ₆	B ₁

Lab-In charge

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DEPARTMENT OF CIVIL ENGINEERING

BUILDING MATERIALS AND CONCRETE TECHNOLOGY LAB (20CE55)

COURSE: III SEMESTER

A.Y: 2022-2023

II CYCLE SCHEDULE: BATCH-A (WEDNESDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V	VI
15/11/2022		A ₁	A ₂	A ₃	A ₄	A ₅	A ₆
22/11/2022		A ₆	A ₁	A ₂	A ₃	A ₄	A ₅
29/11/2022		A ₅	A ₆	A ₁	A ₂	A ₃	A ₄
06/12/2022		A ₄	A ₅	A ₆	A ₁	A ₂	A ₃
13/12/2022		A ₃	A ₄	A ₅	A ₆	A ₁	A ₂
20/12/2022		A ₂	A ₃	A ₄	A ₅	A ₆	A ₁
27/12/2022		<i>REPITATION LAB</i>					
03/01/2023		<i>INTERNAL TEST</i>					

II CYCLE SCHEDULE: BATCH-B (THURSDAY)

Tentative Date of Completion	Actual Date of Completion	I	II	III	IV	V	VI
16/11/2022		B ₁	B ₂	B ₃	B ₄	B ₅	B ₆
23/11/2022		B ₆	B ₁	B ₂	B ₃	B ₄	B ₅
30/11/2022		B ₅	B ₆	B ₁	B ₂	B ₃	B ₄
07/12/2022		B ₄	B ₅	B ₆	B ₁	B ₂	B ₃
14/12/2022		B ₃	B ₄	B ₅	B ₆	B ₁	B ₂
21/12/2022		B ₂	B ₃	B ₄	B ₅	B ₆	B ₁
28/12/2022		<i>REPITATION LAB</i>					
04/01/2023		<i>INTERNAL TEST</i>					

Lab-In charge

LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING (Autonomous)
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BUILDING MATERIALS AND CONCRETE TECHNOLOGY LAB (20CE55)

COURSE: III SEMESTER

A.Y: 2022-23

BATCH:A (Wednesday)	BATCH:B(Saturday)
A ₁ -----20761A0133to 20761A0137	B ₁ ----20761A0101 to 20761A0105
A ₂ -----20761A0138 to 20761A0143	B ₂ ---- 20761A0106 to 20761A0111
A ₃ -----20761A0144 to L-4	B ₃ ---- 20761A0112 to 20761A0116
A ₄ ----- L-5 to L-10	B ₄ ---- 20761A0117 to 20761A0122
A ₅ ----- L-11 to L-17	B ₄ ---- 20761A0123 to 20761A0127
A ₆ -----L-18 to L-last number	B ₆ -----20761A0128 to 20761A0132

Lab-In charge

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L.B.REDDY NAGAR, MYLAVARAM-521 230, A.P, INDIA
DEPARTMENT OF CIVIL ENGINEERING

BUILDING MATERIALS AND CONCRETE TECHNOLOGY LAB (20CE55)

COURSE: III SEMESTER

A.Y: 2022-23

LAB TIMETABLE

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

Batch – A: 20761A0133 to L-25

Batch – B: 20761A0101 to 20761A0132

ACADEMIC CALENDAR

Description	From	To	Weeks
I Phase of Instructions	12-09-2022	05-11-2022	8 W
I Mid Examinations	07-11-2022	12-11-2022	1 W
II Phase of Instructions	14-11-2022	07-01-2023	8 W
II Mid Examinations	02-01-2023	07-01-2023	1 W
Preparation and Practical	09-01-2023	14-01-2023	1 W
Semester End Examinations	16-01-2023	28-01-2023	2 W

Lab-In charge

PROGRAMME OUTCOMES (POs):

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

PROGRAMME SPECIFIC OUTCOMES (PSOs):

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

Course Instructor
(KHK/ Dr. JVR)

Course Coordinator
(KHK)

Module Coordinator
(B.Ramakrishna)

HOD
(Dr.V.Ramakrishna)



LAKIREDDY BALI REDDY COLLEGE OF ENGINEERING

(AUTONOMOUS)

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DEPARTMENT OF CIVIL ENGINEERING

COURSE HANDOUT

PART-A

Name of Course Instructor : Mr.V.Sankararao/Mrs.B.Udaya Lakshmi

Course Name & Code : Solid Mechanics Lab – 20CE54

L-T-P Structure : 0-0-3

Credits : 2

Program/Sem/Sec : B.Tech., CE., III-Sem., A/S

A.Y : 2022-23

PRE-REQUISITE : Building Materials, Applied Mechanics, Solid Mechanics

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The course aims at providing hands on practice to observe the behaviour and failure patterns of commonly used construction materials subjected to tensile, compressive, torsion and shear loadings. The course also deals with the relative hardness and impact resistance of metals.

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

CO1	Estimate compressive strength of wood, concrete, brick materials and decide their suitability for the construction purpose (Evaluate-L5)
CO2	Determine the tensile strength, hardness/ impact resistance of metals used in construction works comment on their usage (Evaluate-L5)
CO3	Determine the Rigidity /Young's modulus of wood/steel materials (Apply-L3)

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

COs	PO1	P O2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO1	2			3										3	
CO2	2			3										3	
CO3	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 BOOK

1. S. Ramamrutam, "Strength of Materials" Dhanpat Rai Publishing Company (P) Limited, New Delhi.

REFERENCES

1. Strength of Materials Laboratory Manual –Department of Civil Engineering -LBRCE

PART-B

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	HOD Sign Weekly
1.	Introduction, COs, POs	03	14.09.2022 17.09.2022			
2.	Determination of hardness of the given material by Brinnel's Method.	03	21.09.2022 24.09.2022		TLM2	
3.	Determination of hardness of the given material by Rockwell hardness test.	03	28.09.2022 01.10.2022		TLM4	
4.	Determination of impact strength of the given material by conducting Charpy test	03	12.10.2022 15.10.2022		TLM4	
5.	Determination of ultimate shear strength of steel by conducting direct shear test	03	19.10.2022 22.10.2022		TLM4	
6.	Study of stress-strain characteristics of mild steel bars by UTM.	03	26.10.2022 29.10.2022		TLM4	
7.	Study of stress-strain characteristics of HYSD bars by UTM	03	02.11.2022 05.11.2022		TLM4	
8.	Determination of modulus of elasticity of the material of the beam by conducting bending test on simply supported beam.	03	09.11.2022 12.11.2022		TLM4	
9.	Determination of modulus of elasticity of the material of the beam by conducting bending test on Cantilever beam	03	16.11.2022 19.11.2022		TLM4	

10.	Determination of compressive strength of wood/ brick with grain parallel / perpendicular to loading.	03	23.11.2022 26.11.2022		TLM4
11.	Determination of modulus of rigidity by conducting torsion test on solid circular shaft	03	30.11.2022 03.12.2022		TLM4
12.	Repetition	03	07.12.2022 10.12.2022		TLM4
13.	Internal Exam	03	14.12.2022 17.12.2022		-

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	12/09/2022	05/11/2022	8
I Mid Examinations	07/11/2022	12/11/2022	1
II Phase of Instructions	14/11/2022	07/01/2023	8
II Mid Examinations	02/01/2023	07/01/2023	1
Preparation and Practicals	09/01/2023	01/01/2023	1
Semester End Examinations	16/01/2023	28/01/2023	2

PART-C

EVALUATION PROCESS:

Evaluation Task	Cos	Marks
Day to Day Evaluation: A	1,2,3	A=5
Internal Lab Exams: B	1,2,3	B=5
Viva Marks: C	1,2,3	C=5
Cumulative Internal Examination : CIE=A+B+C	1,2,3	CIE=15
Semester End Examinations: SEE	1,2,3	SEE=35
Total Marks: CIE+SEE	1,2,3	50

NOTIFICATION OF CYCLES & LIST OF EXPERIMENTS:

Cycle	Exp. No.	Name of the Experiment
Cycle-1	1	Determination of hardness of the given material by brinell's method.
	2	Determination of hardness of the given material by rockwell hardness test.

	3	Determination of impact strength of the given material by conducting charpy test
	4	Determination of modulus of elasticity of the material of the beam by conducting bending test on simply supported beam.
	5	Study of stress-strain characteristics of mild steel bars by UTM.
Cycle-2	6	Determination of ultimate shear strength of steel by conducting direct shear test
	7	Determination of modulus of elasticity of the material of the beam by conducting bending test on canti lever beam.
	8	Determination of compressive strength of wood/ brick with grain parallel / perpendicular to loading.
	9	Study of stress-strain characteristics of HYSD bars by UTM
	10	Determination of modulus of rigidity by conducting torsion test on solid circular shaft

PART-C

PROGRAMME EDUCATIONAL OBJECTIVES:

PEO1: To possess knowledge in both fundamental and application aspects of mathematical, scientific, engineering principles to analyze complex engineering problems for meeting the national and international requirements and demonstrating the need for sustainable development.

PEO2: To adapt to the modern engineering tools for planning, analysis, design, implementation of analytical data and assess their relevant significance in societal and legal issues necessary in their professional career.

PEO3: To exhibit professionalism, ethical attitude, communication, managerial skills, team work and social responsibility in their profession and adapt to current trends by engaging in continuous learning.

PROGRAM OUTCOMES (POs)

Engineering Graduates will be able to:

- 1. Engineering knowledge:** Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
- 2. Problem analysis:** Identify, formulate, review research literature, and analyse 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 modelling to complex engineering activities with an understanding of the limitations.
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PROGRAMME 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 analyse the various laboratory tests required for the professional demands.
3. Possesses basic technical skills to pursue higher studies and professional practice in civil engineering domain.

Mr.V.Sankararao/ Mrs.B.Udaya Lakshmi	Mr.K.V.Viswanadh	Mr.B.Sudheer Kumar	Dr.S.Pichi Reddy
Course Instructor	Course Coordinator	Module Coordinator	HOD



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DEPARTMENT OF INFORMATION TECHNOLOGH

COURSE HANDOUT

PART-A

Name of Course Instructor	: D.Vijaya Sri	
Course Name & Code	: Python Programming Lab (20CS54)	
L-T-P Structure	: 0-0-3	Credits : 1.5
Program/Sem/Sec	: B.Tech.,IT., II-Sem., A Section	A.Y : 2021-22
PRE-REQUISITE	: C Programming	

COURSE EDUCATIONAL OBJECTIVES (CEOs):

The Objective of Python course is to lead the students from the basics of writing and running Python scripts in problem solving and to design and implement the modules and understands the working of classes and objects in python.

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

CO 1	Apply building blocks of Python in solving computational problems. (Apply - L3)
CO 2	Implement in-built data structures available in Python to solve computational problems. (Apply - L3)
CO 3	Implement modular programming, string manipulations and Object-oriented programming in python. (Apply - L3)
CO 4	Improve individual / teamwork skills, communication & report writing skills with ethical values

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

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

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PART-B

Introduction: Language basics and example problems (Two weeks)

- a) Implement Python Script for checking the given year is leap year or not.
- b) Implement Python Script for finding biggest number among 3 numbers.
- c) Implement Python Script for displaying reversal of a number.
- d) Implement Python Script to check given number is Armstrong or not.
- e) Implement Python Script to print sum of N natural numbers.
- f) Implement Python Script to check given number is palindrome or not.
- g) Implement Python script to print factorial of a number.
- h) Implement Python Script to print all prime numbers within the given range.

Module 1: Exercise Programs on Lists.

- a) Write a Python script to display elements of list in reverse order.
- b) Write a Python script to find the minimum and maximum elements without using built-in operations in the lists.
- c) Write a Python script to remove duplicates from a list.
- d) Write a Python script to append a list to the second list.
- e) Write a Python script to count the number of strings in a list where the string length is 2 or more.

Module 2: Exercise Programs on Tuples.

- a) Write a Python script to create a tuple with different data types.
- b) Write a Python script to find the repeated items of a tuple.
- c) Write a Python script to replace last value of tuples in a list.
Sample list: [(10, 20, 40), (40, 50, 60), (70, 80, 90)]
Expected Output: [(10, 20, 100), (40, 50, 100), (70, 80, 100)]
- d) Write a Python script to sort a tuple by its float element.
Sample data: [('item1', '12.20'), ('item2', '15.10'), ('item3', '24.5')]
Expected Output: [('item3', '24.5'), ('item2', '15.10'), ('item1', '12.20')]

Module 3: Exercise Programs on Sets.

- a) Write a Python script to add member(s) in a set.
- b) Write a Python script to perform Union, Intersection, difference and symmetric difference of given two sets.
- c) Write Python script to test whether every element in S is in T and every element in T is in S.

Module 4: Exercise Programs on Dictionaries

- a) Write a Python script to sort (ascending and descending) a dictionary by value.

- b) Write a Python script to check whether a given key already exists or not in a dictionary.
- c) Write a Python script to concatenate following dictionaries to create a new one.
 Sample Dictionary : dic1={1:10, 2:20} dic2={3:30, 4:40} dic3={5:50,6:60}
 Expected Result : {1: 10, 2: 20, 3: 30, 4: 40, 5: 50, 6: 60}
- d) Write a Python script to print a dictionary where the keys are numbers between 1 and 15 (both included) and the values are square of keys.
- e) Write a Python program to map two lists into a dictionary.

Module 5: Exercise Programs on functions and recursion.

- a) Define a function max_of_three() that takes three numbers as arguments and returns the largest of them.
- b) Write a program which makes use of function to display all such numbers which are divisible by 7 but are not a multiple of 5, between given range X and Y.
- c) Define functions to find mean, median, mode for the given numbers in a list.
- d) Define a function which generates Fibonacci series up to n numbers.
- e) Implement a python script for factorial of number by using recursion.
- f) Implement a python script to find GCD of given two numbers using recursion.

Module 6: Exercise programs on Strings

- a) Implement Python Script to perform various operations on string using string libraries.
- b) Implement Python Script to check given string is palindrome or not.
- c) Implement python script to accept line of text and find the number of characters, number of vowels and number of blank spaces in it.
- d) Implement python script that takes a list of words and returns the length of the longest one.

Module 7: Exercise programs on Regular Expressions

- a) Write a Python script to check that a string contains only a certain set of characters (in this case a-z, A-Z and 0-9).
- b) Write a Python script to check whether password is valid or not.
 Conditions for a valid password are:
 Should have at least one number.
 Should have at least one uppercase and one lowercase character.
 Should have at least one special symbol.
 Should be between 6 to 20 characters long.

Module 8: Exercise programs on Matplotlib Library.

- a) Write a Python program to draw a line with suitable label in the X axis, Y axis and a title.
- b) Write a Python program to plot two or more lines with legends, different widths and colors.
- c) Write a Python program to create multiple plots.

- d) Write a Python programming to display a bar chart using different color for each bar.
 e) Write a Python programming to create pie chart with a title.
 f) Write a Python programming to draw a scatter plot with empty circles taking a random distribution in X and Y and plotted against each other
 g)

COURSE DELIVERY PLAN (LESSON PLAN): Section-A

S.No.	Programs to be covered	No. of Classes Required	Tentative Date of Completion	Actual Date of Completion	Teaching Learning Methods	Learning Outcome COs	HOD Sign Weekly
13.	Installation and Working on Interpreter Language Basics and Example Programs	3	02.05.2022		TLM4	CO1,CO4	
14.	Module 0 program basic programs	3	09.05.2022		TLM4	CO1,CO4	
15.	Module-1 Programs on Lists	3	16.05.2022		TLM4	CO1,CO4	
16.	Module-2 Programs on Tuples	3	23.05.2022		TLM4	CO2,CO4	
17.	Module-3 Programs on Sets	3	30.05.2022		TLM4	CO2,CO4	
18.	Module- 4 Programs on Dictionaries	3	06.06.2022		TLM4	CO2,CO4	
19.	Module-5 Programs on Functions & Recursions	3	13.06.2022		TLM4	CO3,CO4	
1st MID Examinations							
20.	Module-6 Exercise programs on Strings	3	27.06.2022		TLM4	CO3,CO4	
21.	Module-7 Exercise programs on Regular Expressions	3	04.07.2022		TLM4	CO3,CO4	
22.	Module-7 Exercise programs on Regular Expressions	3	11.07.2022		TLM4	CO3,CO4	
23.	Module-8 Exercise programs on Matplotlib Library	3	18.07.2022		TLM4	CO3,CO4	
24.	Module-8 Exercise programs on Matplotlib Library	3	25.07.2022		TLM4	CO3,CO4	
25.	Module-8 Exercise programs on Matplotlib Library	3	01.08.2022		TLM4	CO3,CO4	
26.	Internal Lab Exam	3	08.08.2022				

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

PART-C

EVALUATION PROCESS (R20 Regulation): for LABORATORY COURSES

(a) Continuous Internal Evaluation(CIE)

Parameter	Marks
Day-to-day work	05
Record	05
Internal test	05
Total	15

(a) Semester End Examination (SEE)

Parameter	Marks
Procedure / Algorithm	05
Experimentation/Program execution	10
Internal test	10
Observations/Calculations/Validation	05
Result/Inference	05
Viva voce	05
Total	35

PART-D

PROGRAMME OUTCOMES (POs):

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PO12	Life-long learning: Recognize the need for, and have the preparation and ability to engage in independent and life-long learning in the broadest context of technological change.

PROGRAMME SPECIFIC OUTCOMES (PSOs):

PSO1	Organize, Analyze and interpret the data to extract meaningful conclusions.
PSO2	Design, Implement and Evaluate a computer-based system to meet desired needs
PSO3	Develop IT application services with the help of different current engineering tools.

Title	Course Instructor	Course Coordinator	Module Coordinator	Head of the Department
Name of the Faculty	Dr S Naganjaneyulu	Dr. M. Srinivasa Rao	Dr S.Naganjaneyulu	Dr B.Srinivasa Rao
Signature				