MODEL TESTING LAB

(GR20D5020)

I - M.Tech - II Semester

Mr. C Vanadeep

Dr.GVV Satyanarayana

Department of Civil Engineering

Gokaraju Rangaraju Institute of Engineering and Technology

Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

MODEL TESTING LAB

Course File Check List

S.No.	Name of the Format	Page No.
1	Syllabus	
2	Time Table	
3	Program Educational Objectives	
4	Program Objectives	
5	Course Objectives	
6	Course Outcomes	
7	Students Roll List	
8	Guide lines to study the course books & references, course design & delivery	
9	Course Schedule	
10	Unit Plan/Course Plan	
11	Evaluation Strategy	
12	Assessment in relation to COB's and CO's	
13	Tutorial Sheets	
14	Assignment Sheets	
15	Rubric for course	
16	Mappings of CO's and PO's	
17	Model question papers	
18	Mid-I and Mid-II question papers	
19	Mid-I marks	
20	Mid-II marks	
21	Sample answer scripts and Assignments	
22	Course materials like Notes, PPT's, Videos, etc.	

GR 20 Regulations (2021-2022)

GOKARAJU RANGARAJU

INSTITUTE OF ENGINEERING AND TECHNOLOGY

I Year M. Tech. STE – I Semester	**L**	**T/P/D**	**C**
	0	**-/2/-**	**2**

(GR20D5020) MODEL TESTING LAB

TASK1
Generate models like shear walls, portal frames etc., and using appropriate software's.

TASK2
Model testing for frames.

TASK3
Modal Testing of plates, shells under static loading.

TASK4
Modal Testing for free and forced vibrations on frames.

TASK5
Evaluation of dynamic modulus for given structure under loading.

TASK6
Assess the capacity of shear walls under lateral loading

Gokaraju Rangaraju Institute of Engineering and Technology
(Autonomous)
Bachupally, Hyderabad-500090

DEPARTMENT OF CIVIL ENGINEERING (M.Tech)

I YEAR **ROOM NO: 4207** **W.E.F: 15-11-2021**

	1	2	3	4	8	9	10
	9:00-10:00	10:00 - 11:00	11:00-12:00	12:00-1:00	1:00-2:00	2:00-3:00	3:00-4:00
Monday				LUNCH BREAK	SD Lab		
Tuesday							
Wednesday							
Thursday					SD Lab		
Friday							
Saturday							

CODE	Subject	Faculty
GR20D5020	MODEL TESTING LAB	Mr. C Vanadeep & Dr.GVV Satyanarayana

CLASS COORDINATOR **PROGRAMME COORDINATOR** **HOD**

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)

Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

Program Educational Objectives

PEO 1: Graduates of the program will equip with professional expertise on the theories, process, methods andtechniques for building high-quality structures in a cost-effective manner**.**

PEO 2: Graduates of the program will be able to design structural components using contempory softwares and professional tools with quality practices of international standards.

PEO 3: Graduates of the program will be effective as both an individual contributor and a member of adevelopment team with professional, ethical and social responsibilities.

PEO 4: Graduates of the program will grow professionally through continuing education, training, research,and adapting to the rapidly changing technological trends globally in structural engineering.

Program Outcomes

PO 1: An ability to independently carry out research / investigation and development to solve practical problems

PO 2: An ability to write and present a substantial technical report / document.

PO 3: Students should be able to demonstrate a degree of mastery over the area as per the specialization of the program. The mastery should be at a level higher than the requirements in the appropriate bachelor's.

PO 4: Assess the impact of professional engineering solutions in an environmental context along with societal, health, safety, legal, ethical and cultural issues and the need for sustainable development.

PO 5: Possesses critical thinking skills and solves core, complex and multidisciplinary structural engineering problems.

PO 6: Recognize the need for life-long learning to improve knowledge and competence.

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)

Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

COURSE OBJECTIVES

Academic Year : 2021-2022

Semester : II

Name of the Program: M. Tech **Year:** I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Dept.:** Civil Engineering

On completion of this Subject/Course the student shall be able to:

1.	To idealize the effect of structures against extreme loading.
2.	To idealize the response of structure under deferent loading.
3.	To learn about free and forced vibration.
4.	To know the advantage of shear walls.
5	To know the usage of isolation of foundations under vibrations.

Signature of HOD

Date:

Signature of faculty

Date:

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)

Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

COURSE OUTCOMES

Academic Year : 2021-2022

Semester : II

Name of the Program: M.Tech **Year:** I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Dept.:** Civil Engineering

On completion of this Subject/Course the student shall be able to:

	Outcomes
1	Evaluate the response of structure under Static and Dynamic loading.
2	Generate and analyze the various structure for free and forced vibrations against prepared models using appropriate software's.
3	Develop models and test for Static and Dynamic loading
4	Develop models and test for force and free vibrations.
5	Check the stability of shear walls against lateral loading.

Signature of HOD

Date:

Signature of faculty

Date:

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

S.No	Roll No	Name
1	21241D2001	ATKAPURAM PRASHANTH
2	21241D2002	BANDI SRI RAM GOPAL
3	21241D2003	CHALLA MADHAVI
4	21241D2004	PAMMI DIVYA
5	21241D2005	DUMMA UMESH KUMAR
6	21241D2006	K LATHASREE
7	21241D2007	MARIYALA VAISHNAVI
8	21241D2008	MAVOORI PRANAV
9	21241D2009	MITTAPALLI NAGA ASHWINI
10	21241D2010	RAVULA VENKATA SURAJ REDDY
11	21241D2011	REPATI MOHAN BABU
12	21241D2012	SANDHYA CHERUKU
13	21241D2013	SHAIK FEROZ
14	21241D2014	SK SAI CHANDRA
15	21241D2015	THOTA HARSHAVARDHAN
16	21241D2016	VARIKUPPALA LALITHA
17	21241D2017	YAMBA RAMA GNANENDRA SAI
18	21241D2018	YENUMALA DEVESH GOUD
19	21241D2019	S PRASHANTH KUMAR
20	21241D2020	BAVANDLAPELLI THARUN TEJA
21	21241D2021	G NITISH KUMAR

Signature of HOD

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

GUIDELINES TO STUDY THE COURSE SUBJECT

Academic Year	: 2021-2022	**Semester**	: II
Name of the Program:	M.Tech	**Year**	: I Year
Course/Subject	: MODEL TESTING LAB	**Course Code**	: GR20D5020
Name of the Faculty	: Mr. C Vanadeep & Dr. GVV Satyanarayana		
Designation:	Assistant Professor & Professor		

Guidelines to study the course/subject: MODEL TESTING LAB

This course helps the students to learn and understand the concepts of reinforced cement concrete design for structural members like slabs, beams, columns, and footings along with the skills of modeling and analyzing using a MS Excel and an advanced software like STAAD.Pro,ETABS. This also extends to building design statically and dynamically and analysis of roof truss.

So, the students should have the following prerequisites:

- Basic Knowledge in Mathematics
- Good knowledge of Reinforced Concrete Design
- Ability to perform exercise as well as analyze and interpret data.

Where will this subject help?

1. Model Testing Lab helps apply design and analysis concepts using industry software like ETABS.
2. To gain knowledge in analysis and design of advanced structures.
3. To develop a ready to access excel files for all basic structural elements

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering

BOOKS AND MATERIALS

TEXT BOOKS

1. Reinforced Concrete Design, Pillai S. U. and Menon D., Tata McGraw-Hill, 3rd Ed, 1999
2. Illusrate Reinforced Concrete Design, Shah & Karve
3. Advanced Reinforced Concrete Design, Varghese P. C., Prentice Hall of India, New Delhi.

Suggested / Reference Books	
1.	IS 456-2000; Indian Standard Code of Practice for Plain and Reinforced Concrete.
2.	SP 16: Design Aids for Reinforced Concrete
3.	User's Guide ETABS® 2016 Integrated Building Design Software

Web Sites	
1.	**https://standardsbis.bsbedge.com/**
2.	**https://wiki.csiamerica.com/display/doc/ETABS+Training+manuals**
3.	**https://www.youtube.com/watch?v=mTLmMwKvukw&list=PLELbBNWxxKaCAJL_RKmSwjUlkVRgCway9**

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering

COURSE DESIGN AND DELIVERY SYSTEM (CDD)

- The Course syllabus is written into number of learning objectives and outcomes.
- These learning objectives and outcomes will be achieved through lectures, assessments, assignments, experiments in the laboratory, projects, seminars, presentations, etc.
- Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
- The Learning Process will be carried out through assessments of Knowledge, Skills and Attitude by various methods and the students will be given guidance to refer to the text books, reference books, journals, etc.

The faculty be able to –

- Understand the principles of Learning
- Understand the psychology of students
- Develop instructional objectives for a given topic
- Prepare course, unit and lesson plans
- Understand different methods of teaching and learning
- Use appropriate teaching and learning aids
- Plan and deliver lectures effectively
- Provide feedback to students using various methods of Assessments and tools of Evaluation
- Act as a guide, advisor, counselor, facilitator, motivator and not just as a teacher alone

Signature of HOD

Date:

Signature of faculty

Date:

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering

COURSE SCHEDULE

Academic Year : 2021-2022

Semester : II

Name of the Program: M.Tech **Year:** I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor

The Schedule for the whole Course / Subject is:

S.NO	DESCRIPTION	DATE		NO. OF CLASSES
		FROM	TO	
1	Instructions and Demonstration	11-4-2022	11-4-2022	1 Day
2	Cycle -I	18-04-2022	19-5-2022	6 Weeks
3	Cycle – II	23-05-2022	11-07-2022	7 Weeks
4	Revision	14-07-2022	02-08-2022	3 Week
5	Practical Examination	2-8-2022	2-8-2022	1 Week
6	End Examination	15-8-2022	15-8-2022	1 Week

Total No. of Instructional periods available for the course: **90** Hours / Periods

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering

Model Testing Lab

CYCLE -1

TASK1
Generate models like shear walls, portal frames etc., and using appropriate software's.

TASK2
Model testing for frames.

TASK3
Modal Testing of plates, shells under static loading.

CYCLE -2

TASK4
Modal Testing for free and forced vibrations on frames.

TASK5
Evaluation of dynamic modulus for given structure under loading.

TASK6
Assess the capacity of shear walls under lateral loading

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering
SCHEDULE OF INSTRUCTIONS

Academic Year : 2021-2022

Semester : II

Name of the Program: M.Tech **Year:** I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor

The Course plan for the whole Course / Subject is:

Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives&Outcomes Nos.		
1.	11/4/2022	3	Introduction To Model Testing Lab	CO-	1-5	COB- 1-5
2.	18/4/2022	3	RC Design and IS Codal Provisions	CO-	3	COB- 3
3.	21/4/2022	3	Introducton to ETABS	CO-	1, 3	COB- 1, 3
4.	25/4/2022	3	Modelling of simple structure using software	CO-	3	COB- 3
5.	28/4/2022	3	Modelling of simple structure using software	CO-	1, 3	COB- 1, 3
6.	02/5/2022	3	Modelling of simple structure using software	CO-	3	COB- 3
7.	05/5/2022	3	Modelling of shear wall in 3D structural frame	CO-	1, 3	COB- 1, 3
8.	09/5/2022	3	Modelling of shear wall in 3D structural frame	CO-	3	COB- 3
9.	12/5/2022	3	Equivalent static analysis of 3D Structure	CO-	1, 3	COB- 1, 3
10.	16/5/2022	3	Equivalent static analysis of 3D Structure	CO-	3	COB- 3
11.	19/5/2022	3	Equivalent static analysis of 3D Structure with shear wall	CO-	1, 3	COB- 1, 3

12.	23/5/2022	3	Equivalent static analysis of 3D Structure with shear wall	CO- 1-5	COB- 1-5
13.	26/5/2022	3	Response Spectrum analysis of 3D structure	CO- 1-3	COB- 1-4
14.	30/5/2022	3	Response Spectrum analysis of 3D structure with shear wall	CO- 1-3	COB- 1-4
15	02/6/2022	3	Response Spectrum analysis of 3D structure with shear wall	CO- 1-3	COB- 1-4
16	02/6/2022	3	Time History analysis of 3D structure	CO- 1 & 3	COB- 1 – 4
17	13/6/2022	3	Time History analysis of 3D structure with shear wall	CO- 1 & 3	COB- 1 – 4
18	16/6/2022	3	Time History analysis of 3D structure with shear wall	CO- 1 & 3	COB- 1 – 4
19	20/6/2022	3	Push over analysis of 3D structure	CO- 1 & 3	COB- 1 – 4
20	23/6/2022	3	Push over analysis of 3D structure with shear wall	CO- 1 & 3	COB- 1 – 4
21	27/6/2022	3	Push over analysis of 3D structure with shear wall	CO- 1 – 5	COB- 1-5
22	30/6/2022	3	Model testing of free and forced vibrations	CO- 1 – 5	COB- 1-5
23	04/07/2022	3	Evaluation of dynamic modulus of structure for lateral loading	CO- 1-3	COB- 4
24	07/07/2022	3	Assess the capacity of shear wall under lateral loading	CO 3 - 5	COB- 1 & 5
25	11/7/2022	3	Assess the capacity of shear wall under lateral loading	CO- 1- 5	COB- 1
26	14/7/2022	3	Practice exercises		
27	18/07/2022	3	Practice exercises		
28	21/07/2022	3	Practice exercises		
29	28/07/2022	3	Practice exercises		
30	2/8/2022	3	Internal Lab Exam		

Signature of HOD
Date:

Signature of faculty
Date:

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year	:	2021-2022	**Semester**	:	II
Name of the Program:		M.Tech	**Year**	**:**	I Year
Course/Subject	:	MODEL TESTING LAB	**Course Code**	:	GR20D5020
Name of the Faculty	:	Mr. C Vanadeep & Dr.GVV Satyanarayana			

Designation: Assistant Professor & Professor **Department**: Civil Engineering

Lesson No: 1 **Duration of Lesson:** 3 hrs

Lesson Title: Introduction of RC design & IS code

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Understand the RC design basics & usage of IS code

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Structural Elements
Introduction of RC design
Usage of IS code

Assignment Questions:

1. Write down the codes for design of RCC Building Structural Elements (CO1, COB1)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 2 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Design of a structural member
2. Use IS 456 to design and perform checks involved in design
3. Design for shear reinforcements in beam

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Modeling tools and templates, code-based load prescriptions, analysis methods and solution techniques, all coordinate with the grid-like geometry unique to this class of structure.

Assignment / Questions:

1. Determining ETABS software and its methods. (CO 1, COB1)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 3 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings (MS Excel)

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Modelling of simple structure using Etabs

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Modelling of simple structure using ETABS Modelling of 2D Frame structure

Assignment / Questions:

1. Simple Beam Problems (SF and BM) (CO 1, COB1)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 4 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings (Manually)

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Modelling of Shear wall in the structure
2. Use IS 456 to design and perform checks involved in design

TEACHING AIDS : Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS :

Modelling of Shear wall in the structure
Taking loads from IS 875
Using IS Codes in design

Assignment / Questions:

1. Calculate the live loads from IS 875 - Part II for different buildings (CO 1, COB1)
2. Calculate the total ultimate load for those conditions for the given slab (CO 1, COB1)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year	:	2021-2022	**Semester**	:	II
Name of the Program:		M.Tech	**Year**	:	I Year
Course/Subject	:	MODEL TESTING LAB	**Course Code**	:	GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 5,6 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings (ETABS)

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Design of a structural member: One-way Slabs in Excel

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Equivalent Static Analysis of 3D structure Dead load and Live load calculation Modelling of the 3D Structure

Assignment / Questions:

1. Importance of Equivalent static analysis (CO 1, COB1)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 7,8 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings (Manually)

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Design of a structural member: Two-way Slabs (Manually)
2. Use IS 456 to design and perform checks involved in design

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Equivalent Static Analysis of 3D structure with shear wall
Dead load and Live load calculation
Modelling of the 3D Structure

Assignment / Questions:

1. Step-by-step procedure for design of shear wall (CO 1, COB1)
2. Shear wall capacity (CO 1, COB1)

,Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

,

Lesson No: 8,9 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

Response Spectrum Analysis

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Response Spectrum Analysis base shear calculation, time period, mass participation of the structure

Assignment / Questions:

1. What is the modal response spectrum analysis method? (CO2 , COB2)
2. What is the application of response spectrum analysis? (CO2 , COB2)

,Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 10,11 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings (Manual and Excel)

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Design of a structural member: Columns (Manually)
2. Use SP 16 to get % steel from Moment and Axial Loads
3. Design column loaded with biaxial action in MS Excel

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Response Spectrum Analysis with shear wall
base shear calculation, time period,
mass participation of the structure

Assignment / Questions:

1. Response Spectrum Analysis with shear wall (CO2, COB2)
2. Base shear calculation

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 12 & 13 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components of Frame Buildings (Manual and Excel)

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Time History Analysis

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

1. Time History Analysis of 3D structure
2. Acceleration and Displacement

Assignment / Questions:

1. Time History Analysis of 3D structure (CO3, COB3)
2. Practice problems – 3D Frame building

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 14,15 **Duration of Lesson:** 3 hrs

Lesson Title: Time History Analysis

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Understand the Time History Analysis

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Time History Analysis with Shear wall

Assignment / Questions:

1. Time History Analysis of 3D structure with shear wall (CO3, COB3)
2. Practice problems – 3D Frame building . (CO 3, COB3)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 16 **Duration of Lesson:** 3 hrs

Lesson Title: Modelling of Building using Software

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

Time History Analysis

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Modelling of 3D building
Time History Analysis
Fetch the reinforcement details
Identify the SFD and BMD

Assignment / Questions:

1. Analyzing the Time History analysis – SFD & BMD (CO3, COB4)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 17 **Duration of Lesson:** 3 hrs

Lesson Title: Modelling of Building using Software

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Modeling of a 3D portal frame using STAAD PRO

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Push over analysis of 3D structure
Capacity Curve
Identify the SFD and BMD

Assignment / Questions:

1. What is the difference between response spectrum analysis and pushover analysis? (CO3, COB3)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 18 **Duration of Lesson:** 3 hrs

Lesson Title: Design of G+3 storey building using Software

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Model a 3D building (Push Over analysis) with SW

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Modelling in 3D (Push Over analysis) with SW Defining creating and assigning the sections

Assignment / Questions:

1. Model a structure for different plans (CO3, COB3)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 18 **Duration of Lesson:** 3 hrs

Lesson Title: Design of G+5 storey building using Software

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Applying loads on the 3D modeled building
2. Free and Forced Vibrations
3. Analyze the building

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

3D modeling
Applying the loads involved
Analysis on the building

Assignment / Questions:

1. Application of loads based on IS 875 (CO4, COB4)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 19 **Duration of Lesson:** 3 hrs

Lesson Title: Practice on Structural design software

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Model a 3D building
2. Applying loads on the 3D modeled building
3. Analyze the building

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

3D modeling Applying the loads involved with dead and live load Statical Analysis on the building

Assignment / Questions:

1. Model for varying plans (CO3, COB3)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 19 **Duration of Lesson:** 3 hrs

Lesson Title: Practice on Structural design software

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Model a 3D building
2. Applying loads on the 3D modeled building
3. Analyze the building

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

3D modeling
Applying the loads involved with wind load and seismic load
Dynamic analysis under different loading
Analysis on the building

Assignment / Questions:

1. Model for varying plans and heights (CO4, COB4)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 20 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Design of Multi-storied building
2. Response spectrum analysis

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Design of following components of G+5 building.

1. Modelling of Multi-storey building with seismic load
2. Importing the response spectrum data
3. Analysis of structure under dynamic loading

Assignment / Questions:

1. Short notes on dynamic analysis of structure (CO3,4, COB4)
2. Make a note of different types dynamic analysis (CO3,4, COB4)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 21 **Duration of Lesson:** 3 hrs

Lesson Title: Design of all the Structural Components

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Design of Multi-storied building
2. Time History analysis

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Design of following components of G+5 building.

1. Modelling of Multi-storey building with seismic load
2. Importing the time history data
3. Analysis of structure under dynamic loading

Assignment / Questions:

1. Short notes on Time history analysis (CO4, COB4)
2. Loads and Load combinations (CO4, COB4)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

LESSON PLAN

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr. GVV Satyanarayana

Designation: Assistant Professor & Professor **Department:** Civil Engineering

Lesson No: 22 & 23 **Duration of Lesson:** 3 hrs

Lesson Title: Analysis of Bridge Deck slab

INSTRUCTIONAL/LESSON OBJECTIVES:

On completion of this lesson the student shall be able to:

1. Assessing the capacity of shear walls under lateral loading
2. Analysis of the model

TEACHING AIDS **:** Lab Manual, Laptop, Projector, Demonstration.

TEACHING POINTS **:**

Modelling steps involved for Shear wall with lateral loading
Materials and support conditions
Loads over shear wall

Assignment / Questions:

1. Make a note of different types of shear wall (CO5, COB5)
2. Practice problems (CO5,COB5)

Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering

COURSE COMPLETION STATUS

Academic Year : 2021-2022 **Semester** : II

Name of the Program: M.Tech **Year** : I Year

Course/Subject : MODEL TESTING LAB **Course Code** : GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation: Assistant Professor & Professor

Actual Date of Completion & Remarks, if any

Cycle	Remarks	Objectives Achieved	Outcomes Achieved
Cycle I	Covered in Time	1,2,3	1,2,3
Cycle II	Covered in Time	1,3,4,5	1,3,4,5

Signature of HOD

Date:

Signature of faculty

Date:

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering
EVALUATION STRATEGY

Academic Year : 2021-2022 **Semester : II**

Name of the Program: M.Tech **Year : I Year**

Course/Subject :MODEL TESTING LAB **Course Code :** GR20D5020

Name of the Faculty :Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation **:** Assistant Professor & Professor **Department:** Civil Engineering

1. TARGET:

a) Percentage for pass: 100%

b) Percentage of class:

First class with distinction	20
First class	20
Pass class	00
Total strength	21

2. COURSE PLAN & CONTENT DELIVERY

- 100 practice classes held for detailed demonstration of experiments and for analyzing real time experiments in the lab.

3. METHOD OF EVALUATION

3.1 ☐ Continuous Assessment Examinations (CAE-I, CAE-II)

3.2 ☐ Assignments/Seminars

3.3 ☐ Mini Projects

3.4 ☐ Quiz

3.5 ☐ Semester/End Examination

3.6 ☐ Others

4. List out any new topic(s) or any innovation you would like to introduce in teaching the subjects in this Semester.

GokarajuRangaraju Institute of Engineering and Technology (Autonomous)

Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

Assessment in relation to CO's and COB's

Assessment:

1. Assignment
2. Internal Examination
3. External Examination
4. Practical Projects
5. Viva

Course Outcomes / Assessments	1	2	3	4	5
1	X	X	X	X	X
2	X	X	X	X	X
3	X	X	X	X	X
4					
5					

Course Objectives / Assessments	1	2	3	4	5
1	X	X	X	X	X
2	X	X	X	X	X
3	X	X	X	X	X
4					
5					

GokarajuRangaraju Institute of Engineering and Technology (Autonomous)
Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

Mappings of CO's, COB's Vs PO's, POB's

Course Objectives - Course Outcomes Relationship Matrix

Course Objectives \ Course Outcomes	1	2	3	4	5
1	X	X	X		
2	X	X			
3	X		X		
4		X			
5				X	X

Course Outcomes - Program Outcomes relations (Contributions: High, Medium and Low)

MODEL TESTING LAB (GR20D5020)CO's	1	2	3	4	5	6
Evaluate the response of structure under Static and Dynamic loading.	H	H	H		M	M
Generate and analyze the various structure for free and forced vibrations against prepared models using appropriate software's.	H	H	H			M
Develop models and test for Static and Dynamic loading	M	M	M			M
Develop models and test for force and free vibrations.	M	H	H		M	M
Check the stability of shear walls against lateral loading.	H	H	H	M	M	M

Course Objectives - Program Outcomes (PO's) Relationship Matrix

Program Outcomes / Course Objectives	1	2	3	4	5	6
1	H	H	H		M	M
2	H	H	H			M
3	M	M	M			M
4	M	M	M			M
5	H	H	H	M	M	M

Course Outcomes - Program Outcomes relations (PO's) Relationship Matrix

Program Outcomes / Course Outcomes	1	2	3	4	5	6
1	x	x	x		x	x
2	x	x	x			x
3	x	x	x			x
4	x	x	x			x
5	x	x	x	x	x	x

Courses (with title & code)-Program Outcomes (PO's) Relationship Matrix

Course: MODEL TESTING LAB

Program Outcomes / Courses	1	2	3	4	5	6
1	x		x	x	x	x

Program Educational Objectives (PEOs) - Course Outcomes Relationship Matrix

Program Educational Objectives / Course Outcomes	1	2	3	4
1	x			x
2	x		x	x
3	x	x	x	
4	x	x		
5	x		x	x

GokarajuRangaraju Institute of Engineering and Technology (Autonomous)

Bachupally, Kukatpally, Hyderabad – 500 090. (040) 6686 4440

Rubric Template – MODEL TESTING LAB

Academic Year : 2021-2022 **Semester : I**

Name of the Program: M.Tech **Year : I Year**

Course/Subject : MODEL TESTING LAB **Course Code :** GR20D5020

Name of the Faculty : Mr. C Vanadeep & Dr.GVV Satyanarayana

Designation : Assistant Professor & Professor **Department:** Civil Engineering

		Beginning	Developing	Reflecting Development	Accomplished	Exemplary	Score
Name of the Student	**Performance Criteria**	**1**	**2**	**3**	**4**	**5**	
	Level of knowledge on fundamental laboratory tests and collect, analyze or synthesize appropriate data.	Inability to perform fundamental laboratory tests or collect, analyze, or synthesize appropriate data	Able to collect, analyze, and synthesize data related to the properties and behavior of soils in the geotechnical laboratory	Ability to observe collection of samples, perform fundamental laboratory tests, and collect, analyze, and synthesize appropriate data.	Knowledge on collection of Samples & independently perform fundamental laboratory tests, and collect, analyze, and synthesize appropriate data with few procedural errors	Full knowledge on collection of soil samples, independently perform fundamental laboratory tests, and collect, analyze, and synthesize appropriate data with no procedural errors	5
	Level of knowledge on properties of SCC mixes and assessment using appropriate laboratory analysis.	Low level of knowledge on scc properties and the respective laboratory analyses.	Able to understand the importance of SCCmixes and effecting factors.	Ability to apply the knowledge of scc properties in choosing appropriate laboratory analysis	Full Knowledge on properties of scc and assessment of vital parameters using laboratory analyses.	Analyzing all practical aspects of scc properties and their key role in the field of construction.	5
	Level of knowledge on tensile, compressive and flexure strength properties and their real time applications.	Low level of knowledge on strength parameters and their real time applications.	Able to understand the strength parameters under various loading conditions.	Ability to apply the knowledge in the determination of strength parameters	Full knowledge on strength parametersand the respective laboratory analyses.	Analyzing the importance of strength parameters under various existing conditions and their respective applications.	5

Department of Civil Engineering
MODEL TESTING LAB

1. Analyse and Design the 3D frame (G+5) (ESA) with a size of 15 m x 20 m consists of 3 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

2. Analyse and Design the 3D frame (G+6) (ESA)with shear wall a size of 20 m x 25 m consists of 4 m x 5 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

3. Analyse and Design the 3D frame (G+7) (RSA)with shear wall with a size of 25 m x 20 m consists of 5 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

4. Analyse and Design the 3D frame (G+5) (RSA)with shear wall with a size of 15 m x 20 m consists of 3 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

5. Analyse and Design the 3D frame (G+6) (RSA)with shear wall with a size of 20 m x 25 m consists of 4 m x 5 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

6. Analyse and Design the 3D frame (G+7) (THA)with shear wall with a size of 25 m x 20 m consists of 5 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

7. Analyse and Design the 3D frame (G+7) (THA)with shear wall with a size of 25 m x 20 m consists of 5 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

8. Analyse and Design the 3D frame (G+5) (THA)with shear wall with a size of 15 m x 20 m consists of 3 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

9. Analyse and Design the 3D frame (G+6) (POA)with shear wall with a size of 20 m x 25 m consists of 4 m x 5 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.

10. Analyse and Design the 3D frame (G+7) (POA)with shear wall with a size of 25 m x 20 m consists of 5 m x 4 m Bay sizewith DL, LL with their load combinations. Assume whichever data necessary.