Design of Formwork

(Sub Code: GR20D5015)

II Year M.Tech - I Semester(AY 2021-22)

Mrs. K.Hemalatha

(Asst. Professor)

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 (Structural Engineering)
Design of Formwork Theory
Course File Check List

S.No.	Name of Format	Page No.
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8	Guidelines to study the course, books, References,Course design and delivery	
9	Course Schedule	
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15	Rubric for Course	
16	Mappings of CO's and PO's	
17	Model question papers	
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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
SYLLABUS

Unit I

Introduction to formwork: Requirements and Selection of Formwork, Formwork Materials Timber, Plywood, Steel, Aluminium, Plastic, and Accessories. Horizontal And Vertical Formwork Supports.

Unit II

Formwork Design: Concepts, Formwork Systems and Design for Foundations, Walls, Columns, Slab and Beams.

Unit III

Formwork Design for Special Structures: Shells, Domes, Folded Plates, Overhead Water Tanks, Natural Draft Cooling Tower and Bridges.

Unit IV

Flying Formwork: Table Form, Tunnel Form, Slip Form, Formwork for Precast Concrete, Formwork Management Issues –Pre- and Post-Award.

Unit V

Formwork Failures: Causes and Case studies in Formwork Failure, Formwork Issues in Multi Story Building Construction

Reference Books & Codes

1. Formwork for Concrete Structures, Purify, McGraw Hill India, 2015.
2. Formwork for Concrete Structures, Kumar Neerajha, Tata McGraw Hill Education, 2012.
3. IS 14687: 1999, False work for Concrete Structures – Guidelines; BIS, New Delhi.

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
INDIVIDUAL TIME TABLE

I Year II Sem **ROOM NO: 4103** **W.E.F: 11.04.2022**

Day	1	2	3	4	5	6	7
	9:00-10:00	10:00-11:00	11:00-12:00	12:000-1:00	1:00-2:00	2:00-3:00	3:00-4:00
Monday				LUNCH BREAK			
Tuesday		DFW					
Wednesday		DFW					
Thursday	DFW						
Friday		DFW					
Saturday			DFW				

CODE	Subject	Faculty
GR20D5015	Design of Formwork	Mrs K Hemalatha

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

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DEPARTMENT OF CIVIL ENGINEERING
(STRUCTURAL ENGINEERING)

PEOs AND POs

Programme Educational Objectives (PEOs)

PEO1: Graduates of the program will equip with professional expertise on the theories, process, methods and techniques for building high-quality structures in a cost-effective manner.

PEO2: Graduates of the program will be able to design structural components using contemporary softwares and professional tools with quality practices of international standards.

PEO3: Graduates of the program will be effective as both an individual contributor and a member of a development team with professional, ethical and social responsibilities.

PEO4: Graduates of the program will grow professionally through continuing education, training, research, and adapting to the rapidly changing technological trends globally in structural engineering.

Programme Outcomes (POs)

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.

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
COURSE OBJECTIVES

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

On completion of this Course students shall be able to

S.No.	Objectives
1	To make the student to understand the necessity and types of form work for various structures of Civil Engineering
2	To prepare the student to select proper type of form work, accessories and materials required
3	To train the student to carry out the design the form work for various structural elements like beam, slab, column, wall & foundation and for special structures like shells, retaining walls, bridges, bunkers & water tanks.
4	To make the student to understand the working of flying form work like tunnel forms, slip forms and table forms
5	To motivate the students to Judge the form work failures and to assess the form work issues in multi – storey building construction through case studies.

Signature of HOD Signature of Faculty

Date: Date:

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
COURSE OUTCOMES

Academic Year :2021-22
Semester II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor
The expected Outcomes of this Course are

S.No.	Outcomes
1	Understand the necessity and types of form work for various structures of civil Engineering and select proper type of form work, accessories and materials required.
2	Design the form work for various structural elements like beam, slab, column, wall and foundation.
3	Design the form work for special structures like shells, retaining walls, bridges, Sylos, bunkers & water tank
4	Understand the working of flying form work like tunnel forms, slip forms and table forms
5	Judge the form work failures from case studies.

Signature of HOD Signature of Faculty

Date: Date:

Gokaraju Rangaraju Institute of Engineering and Technology
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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
STUDENTS ROLL LIST

S.No	ROLL NUMBER	NAME OF THE STUDENT
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

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

GUIDELINES TO STUDY THE COURSE/SUBJECT

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

Guidelines to study the course Surveying Theory

Design of Formwork professionals must have strong mathematical skills in order to understand the complexities of designs. Design of Formwork requires specialized formwork materials-precision and electromechanical instruments and global positioning technologies, to acquire spatial data, perform data reduction, analyze measurements and make data adjustments.

Students should have the following prerequisites

1. Fundamentals of Engineering mathematics
2. Knowledge of basic science

To make the student to understand the necessity and types of form work for various structures of Civil Engineering. • To prepare the student to select proper type of form work, accessories and materials required. • To train the student to carry out the design the form work for various structural elements like beam, slab, column, wall & foundation and for special structures like shells, retaining walls, bridges, bunkers & water tanks. • To make the student to understand the working of flying form work like tunnel forms, slip forms and table forms. • To motivate the students to Judge the form work failures and to assess the form work issues in multi – storey building construction through case studies.Where will this subject help?

1. Design of Formwork to understand the necessity and types of form work for various structures of civil Engineering and select proper type of form work, accessories and materials required.The main objective is to prepare the plans or maps and to carry out their areas and volumes
2. It helps in design the form work for various structural elements like beam, slab, column, wall and foundation..
3. It helps design the form work for special structures like shells, retaining walls, bridges, Sylos, bunkers & water tank
4. It also helps Understand the working of flying form work like tunnel forms, slip forms and table forms.

Books/Material

S.No.	Text Books
1	Formwork for Concrete Structures, Peurify, McGraw Hill India, 2015
2	Formwork for Concrete Structures, Kumar NeerajJha, Tata McGraw Hill Education, 2012
3	IS 14687: 1999, False work for Concrete Structures – Guidelines; BIS, New Delhi.

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
COURSE DESIGN AND DELIVERY SYSTEM

1. The course syllabus is written into number of learning objectives and learning outcomes.
2. These learning objectives and outcomes will be achieved through lectures, assessments, assignments, experiments in the laboratory, projects, seminars and presentations, etc.,
3. Every student will be given an assessment plan, criteria for assessment, scheme of evaluation and grading method.
4. The learning process will be carried out through assessment of knowledge, skills and attitude by various methods and the student will be given guidance to refer to the textbooks, 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, lesson and unit plan
- Understand different methods of teaching and learning
- Use appropriate teaching and learning aids
- Plan and deliver lectures effectively
- Provide feedback system 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:

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
COURSE SCHEDULE

Academic Year :2021-22
Semester II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor
Schedule for the whole course is:

Unit	Description	Duration (Date)		Total No. of Periods	Blooms taxonomy level
		From	To		
1	Introduction to formwork	13-04-2022	10-05-2022	10	K3
2	Formwork Design	11-05-2022	21-05-2022	10	K3
3	Formwork Design for Special Structures	24-05-2022	07-07-2022	10	K3
4	Flying Formwork	08-07-2022	02-08-2022	10	K3
5	Formwork Failures	03-08-2022	13-08-2022	8	K3

Signature of Faculty

Date:

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
COURSE PLAN

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

Unit No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	Bloom Taxonomy	References(Text Book, Journal…) Page Nos.: _____to
1.	1.	13-04-2022	1	Introduction to formwork	COB's - 1 CO's - 1	K2	Design of Formwork Vol 1&2 Peurify, McGraw Hill India Pg No 21-49
	2.	19-04-2022	1	Introduction to formwork	COB's - 1 CO's - 1	K2	
	3.	20-04-2022	1	Introduction to formwork	COB's - 1 CO's - 1	K2	
	4.	21-04-2022	1	Requirements and Selection of Formwork	COB's - 1 CO's - 1	K2	
	5.	27-04-2022	1	Requirements and Selection of Formwork	COB's - 1 CO's - 1	K2	
	6.	28-04-2022	1	Formwork Materials	COB's - 1 CO's - 1	K1	
	7.	30-04-2022	1	Timber	COB's - 1 CO's - 1	K3	
	8.	04-05-2022	1	Plywood	COB's - 1 CO's - 1	K3	
	9.	05-05-2022	1	Steel, Aluminium, Plastic	COB's - 1 CO's - 1	K3	
	10.	10-05-2022	1	Form work selection	COB's - 1 CO's - 1	K3	

2.	11	11-05-2022	1	Formwork Design Concepts	COB's –2 CO's - 2	K2	Design of Formwork Vol 1&2 Peurify, McGraw Hill India Pg No 55-186
	12	12-05-2022	1	Formwork Design Concepts	COB's –2 CO's - 2	K2	
	13	16-05-2022	1	Formwork Systems	COB's –2 CO's - 2	K3	
	14	18-05-2022	1	Design for Foundations	COB's –2 CO's - 2	K3	
	15	19-05-2022	1	Design for Foundations	COB's –2 CO's - 2	K4	
	16	20-05-2022	1	Design for Walls	COB's –2 CO's -2	K4	
	17	21-05-2022	1	Design for Walls	COB's –2 CO's - 2	K4	
	18	21-05-2022	1	Design for Columns	COB's –2 CO's - 2	K4	
	19	22-05-2022	1	Design for Columns	COB's –2 CO's - 2	K4	
	20	22-05-2022	1	Slab and Beams	COB's –2 CO's - 2	K4	
3.	21	24-05-2022	1	Formwork Design for Special Structures	COB's –3 CO's - 3	K3	Design of Formwork Vol 1&2 Peurify, McGraw Hill India Pg No 229-290
	22	28-05-2022	1	Formwork Design for Special Structures	COB's –3 CO's - 3	K3	
	23	29-05-2022	1	Shells	COB's –3 CO's -3	K3	
	24	02-06-2022	1	Shells	COB's –3 CO's - 3	K3	
	25	03-06-2022	1	Domes	COB's –3 CO's - 3	K3	
	26	04-06-2022	1	Folded Plates	COB's –3 CO's - 3	K3	
	27	09-06-2022	1	Folded Plates	COB's –3 CO's - 3	K2	
	28	10-06-2022	1	Overhead Watertanks	COB's –3 CO's - 3	K3	
	29	11-06-2022	1	Tower and Bridges	COB's –3 CO's - 3	K3	
	30	13-06-2022		Tower and Bridges	COB's –3 CO's - 3	K3	
4.	31	14-06-2022	1	Flying Formwork	COB's - 4 CO's - 4	K2	Design of Formwork Vol 1&2 Peurify, McGraw Hill India Pg No 292-419
	32	20-06-2022	1	Table Form	COB's - 4 CO's - 4	K3	
	33	02-07-2022	1	Table Form	COB's - 4 CO's - 4	K3	
	34	04-07-2022	1	Tunnel Form	COB's - 4 CO's - 4	K3	
	35	05-07-2022	1	Tunnel Form	COB's - 4 CO's -4	K3	
	36	06-07-2022	1	Slip Form	COB's - 4 CO's - 4	K3	

	37	07-07-2022	1	Slip Form	COB's - 4 CO's - 4	K3	
	38	08-07-2022	1	Formwork for Precast Concrete	COB's - 4 CO's - 4	K2	
	39	19-07-2022	1	Formwork for Precast Concrete	COB's - 4 CO's - 4	K3	
	40	20-07-2022	1	Formwork Management Issues	COB's - 4 CO's - 4	K2	
5.	41	02-08-2022	1	Formwork Management Issues	COB's - 5 CO's - 5	K2	Design of Formwork Vol 1&2 Peurify, McGraw Hill India Pg No 431-513
	42	03-08-2022	1	Pre- and Post-Award	COB's - 5 CO's - 5	K3	
	43	04-08-2022	1	Pre- and Post-Award	COB's - 5 CO's - 5	K3	
	44	06-08-2022	1	Formwork Failures	COB's - 5 CO's - 5	K3	
	45	09-08-2022	1	Formwork Failures	COB's - 5 CO's - 5	K2	
	46	10-08-2022	1	Causes and Case studies in Formwork Failure	COB's - 5 CO's - 5	K2	
	47	11-08-2022	1	Causes and Case studies in Formwork Failure	COB's - 5 CO's - 5	K3	
	48	13-08-2022	1	Causes and Case studies in Formwork Failure	COB's - 5 CO's - 5	K3	

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
SCHEDULE OF INSTRUCTIONS
UNIT PLAN

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

Unit No.	Topics/Sub Topics	Date	No. of Periods	Objectives & Outcomes No.	References (Text book, Journal…)	Blooms taxonomy level
UNIT I	Introduction to formwork	13-04-2022	1	COb-1 & CO- 1	Design of Formwork Vol 1 Peurify, McGraw Hill India	K2
	Introduction to formwork	19-04-2022	1	COb-1 & CO- 1		K2
	Introduction to formwork	20-04-2022	1	COb-1 & CO- 1		K2
	Requirements and Selection of Formwork	21-04-2022	1	COb-1 & CO- 1		K2
	Requirements and Selection of Formwork	27-04-2022	1	COb-1 & CO- 1		K2
	Formwork Materials	28-04-2022	1	COb-1 & CO- 1		K1
	Timber	30-04-2022	1	COb-1 & CO- 1		K3
	Plywood	04-05-2022	1	COb-1 & CO- 1		K3
	Steel, Aluminium, Plastic	05-05-2022	1	COb-1 & CO- 1		K3
	Form work selection	10-05-2022	1	COb-1 & CO- 1		K3

Signature of HOD Signature of faculty

Date: Date:

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
SCHEDULE OF INSTRUCTIONS
UNIT PLAN

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech — Year: I YEAR
Course : Design of Formwork — Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha — Dept: Civil Engineering
Designation : Assistant Professor

Unit No	Topics/Sub Topics	Date	No. of Periods	Objectives & Outcomes No.	References (Text book, Journal…)	Blooms taxonomy level
UNIT II	Formwork design concepts	05-05-22	1	COb-3 & CO- 2	Design of Formwork Vol 1 Peurify, McGraw Hill India	K2
	Formwork design concepts	10-05-22	1	COb-3 & CO- 2		K2
	Formwork design systems	11-05-22	1	COb-3 & CO- 2		K3
	Formwork design systems	12-05-22	1	COb-3 & CO- 2		K3
	Design for foundation	16-05-22	1	COb-3 & CO- 2		K4
	Design for foundation	18-05-22	1	COb-3 & CO- 2		K4
	Design for walls	19-05-22	1	COb-3 & CO- 2		K4
	Design for Columns	20-05-22	1	COb-3 & CO- 2		K4
	Design for Slabs	21-05-22	1	COb-3 & CO- 2		K4
	Design for beams	22-05-22	1	COb-3 & CO- 2		K4

Signature of HOD — Signature of faculty

Date: — Date:

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
SCHEDULE OF INSTRUCTIONS
UNIT PLAN

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

Unit No.	Topics/Sub Topics	Date	No. of Periods	Objectives & Outcomes No.	References (Text book, Journal…)	Blooms taxonomy level
Unit III	Formwork Design for Special Structures	24-05-2022	1	CObs-3 & CO - 3	Design of Formwork Vol 1 Peurify, McGraw Hill India	K3
	Formwork Design for Special Structures	28-05-2022	1	CObs-3 & CO - 3		K3
	Shells	14-06-2022	1	CObs-3 & CO - 3		K3
	Shells	20-06-2022	1	CObs-3 & CO - 3		K3
	Domes	02-07-2022	1	CObs-3 & CO - 3		K3
	Folded Plates	04-07-2022	1	CObs-3 & CO - 3		K3
	Folded Plates	05-07-2022	1	CObs-3 & CO - 3		K2
	Overhead Watertanks	06-07-2022	1	CObs-3 & CO - 3		K3
	Tower and Bridges	07-07-2022	1	CObs-3 & CO - 3		K3
	Tower and Bridges	07-07-2022	1	CObs-3 & CO - 3		K3

Signature of HOD Signature of faculty

Date: Date:

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
SCHEDULE OF INSTRUCTIONS
UNIT PLAN

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

Unit No.	Topics/Sub Topics	Date	No. of Periods	Objectives & Outcomes No.	References (Text book, Journal…)	Blooms taxonomy level
UNIT IV	Flying Formwork	19-07-2022	1	COb-4 & CO- 4	Design of Formwork Vol 1&2 Peurify, McGraw Hill India	K2
	Table Form	20-07-2022	1	COb-4 & CO- 4		K3
	Table Form	21-07-2022	1	COb-4 & CO- 4		K3
	Tunnel Form	26-07-2022	1	COb-4 & CO- 4		K3
	Tunnel Form	27-07-2022	1	COb-4 & CO- 4		K3
	Slip Form	28-07-2022	1	COb-4 & CO- 4		K3
	Slip Form	28-07-2022	1	COb-4 & CO- 4		K3
	Formwork for Precast Concrete	30-07-2022	1	COb-4 & CO- 4		K2
	Formwork for Precast Concrete	02-08-2022	1	COb-4 & CO- 4		K3

Signature of HOD Signature of faculty

Date: Date:

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SCHEDULE OF INSTRUCTIONS
UNIT PLAN

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

Unit No.	Topics/Sub Topics	Date	No. of Periods	Objectives & Outcomes No.	References (Text book, Journal…)	Blooms taxonomy level
UNIT V	Formwork Management Issues	03-08-2022	1	COb-5 & CO- 5	Design of Formwork Vol 1 Peurify, McGraw Hill India	K2
	Pre- and Post-Award	04-08-2022	1	COb-5 & CO- 5		K3
	Pre- and Post-Award	06-08-2022	1	COb-5 & CO- 5		K3
	Formwork Failures	09-08-2022	1	COb-5 & CO- 5		K3
	Formwork Failures	10-08-2022	1	COb-5 & CO- 5		K2
	Causes and Case studies in Formwork Failure	10-08-2022	1	COb-5 & CO- 5		K2
	Causes and Case studies in Formwork Failure	11-08-2022	1	COb-5 & CO- 5		K3
	Causes and Case studies in Formwork Failure	12-08-2022	1	COb-5 & CO- 5		K3
	Formwork Issues in Multi Story Building Construction	13-08-2022	1	COb-5 & CO- 5		K3

Signature of HOD Signature of faculty

Date: Date:

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)

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

LESSON PLAN

Academic **Y**ear : 2021-22 Date: 4/13/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:1 Duration of Lesson: 1hr

Lesson Title: Introduction to formwork

Instructional/Lesson Objectives:

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

1. Understand terminology in Formwork
2. The brief definitions of sheathing, scaffolding, falsework, centering, mould as per IS code

Teaching Aids : white board,

Different color markers Teaching Points :

Introduction to formwork and terminology

Assignment / Questions:

1. Outline the following terms:
   a) Sheathing b) Scaffolding c) Centering
   d) False work CO 1, BL 1

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 4/19/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:2 Duration of Lesson: 1hr

Lesson Title: Formwork Requirements

Instructional/Lesson Objectives:

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

Understant basic requirements for any form work.

Teaching Aids : white board,

Different colour markers Teaching Points :

Requirements for any formwork like quality, safety and ecenomy

Assignment / Questions:

1. Explain about the requirements for Formwork in detail. CO 1, BL2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 4/20/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:3		Duration of Lesson: 1hr

Lesson Title: Selection of Formwork

Instructional/Lesson Objectives:

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

Outline the selection of formwork based on various categories.

Teaching Aids : white board,

Different colour markers Teaching Points :

Selection of formwork based on building design, safety etc.,

Assignment / Questions:

1. Explain about the Job specifications in detail to select the formwork. CO 1, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 4/21/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:4		Duration of Lesson: 1hr

Lesson Title: Requirements and Selection of Formwork

Instructional/Lesson Objectives:

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

Requirements and Selection of Formwork

Teaching Aids : white board,

Different colour markers Teaching Points :

Requirements and Selection of Formwork

Assignment / Questions:

1. List out the main Requirements and Selection of Formwork. CO 1, BL 2
2. Mention the local conditions to follow in selecting Formwork. CO 1, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 4/27/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:5		Duration of Lesson: 1hr

Lesson Title: Requirements and Selection of Formwork

Instructional/Lesson Objectives:

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

Requirements and Selection of Formwork

Teaching Aids : white board,

Different colour markers Teaching Points :

Requirements and Selection of Formwork

Assignment / Questions:

1. Interpret the main factors affecting selection of Form work. CO 1, BL 2

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 4/28/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:6 Duration of Lesson: 1hr

Lesson Title: Formwork Materials

Instructional/Lesson Objectives:

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

1. Differentiate different Formwork Materials like Plywood, Steel, Aluminium, Timber.

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Materials

Assignment / Questions:

1. Differentiate various types of Formwork materials. CO 1, BL1

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 4/30/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:7 Duration of Lesson: 1hr

Lesson Title: Timber material

Instructional/Lesson Objectives:

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

Understant Timber material form work Advantages and disadvantages.

Teaching Aids : white board,

Different colour markers Teaching Points :

Timber material Advantages and Limitations

Assignment / Questions:

1. What are the factors affecting the Reuse of Timber material in Formwork. CO 1, BL 1
2. List out the characteristics of good quality timber material. CO 1, BL 1

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 5/4/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:8 Duration of Lesson: 1hr

Lesson Title: Plywood

Instructional/Lesson Objectives:

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

Plywood material in Form work

Teaching Aids : white board,

Different colour markers Teaching Points :

Plywood material applications in construction field

Assignment / Questions:

1. Characterize the features of Plywood Form work material. CO 1, BL2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/5/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:9		Duration of Lesson: 1hr

Lesson Title: Steel, Aluminium, Plastic

Instructional/Lesson Objectives:

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

Explain Steel, Aluminium, Plastic type of Formwork materials.

Teaching Aids : white board,

Different colour markers Teaching Points :

Distinguish the features of Steel, Aluminium, Plastic tyoe formwork

Assignment / Questions:

1. Under what circumstances will one prefer to adopt fiber reinforced plastic as formwork material and why? CO 1, BL 3
2. What are the advantages of using aluminum forms? CO 1, BL 1

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/10/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:10		Duration of Lesson: 1hr

Lesson Title: Form work selection

Instructional/Lesson Objectives:

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

Plaster of Paris forms applications

Teaching Aids : white board,

Different colour markers Teaching Points :

Assignment / Questions:

1. For what purposes are the plaster of Paris forms used? CO 1, BL 3
2. What are the factors which govern the selection of form material? Find out their relative importance. Develop a decision tool to select the most economical form material under a given situation. CO 1, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/11/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:11		Duration of Lesson: 1hr

Lesson Title: Formwork Design Concepts

Instructional/Lesson Objectives:

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

Formwork Design Concepts

Teaching Aids : white board,

Different colour markers Teaching Points :

Requirements for Formwork Design Concepts

Assignment / Questions:

1. As per Indian Standards, outline the main requirements for designing Formwork. CO 2, BL 2
2. Describe different loads exerted on Formwork. CO 2, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/12/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:12		Duration of Lesson: 1hr

Lesson Title: Formwork Design Concepts

Instructional/Lesson Objectives:

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

Factors affecting lateral pressure of fresh Concrete

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Design Concepts in terms of lateral pressure as per ACI formula and IS codes.

Assignment / Questions:

1. Elucidate the various factors affecting Lateral pressure as per ACI formula, IS code.
   CO 2, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/16/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:1		Duration of Lesson: 1hr

Lesson Title: Formwork Systems

Instructional/Lesson Objectives:

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

Assumptions made in Formwork design system.

Teaching Aids : white board,

Different colour markers Teaching Points :

The basis for Formwork design in terms of stesses.

Assignment / Questions:

1. How to estimate permissible stresses on Form work system. CO 2, BL 3
2. Estimate the total load exerted on the formwork of a RCC slab of thickness 250 mm. Assume a live load of 2.4 kN/m2 and self-weight of forms as 0.4 kN/m2. CO 2, BL 4

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/18/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:14		Duration of Lesson: 1hr

Lesson Title: Design for Foundations

Instructional/Lesson Objectives:

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

Explain Formworks for small and large isolated footing.

Teaching Aids : white board,

Different colour markers Teaching Points :

Design steps in small and large isolated footing

Assignment / Questions:

1. Organize the sequence of steps to characterize the procedure for isolated footings.
   CO 2, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/19/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:15		Duration of Lesson: 1hr

Lesson Title: Design for Foundations

Instructional/Lesson Objectives:

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

Design Pocedure for Column footing

Teaching Aids : white board,

Different colour markers Teaching Points :

Design steps in detail for various types of footings.

Assignment / Questions:

1. Elucidate the different steps in foundation wall. CO 2, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/20/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:16		Duration of Lesson: 1hr

Lesson Title: Design for Walls

Instructional/Lesson Objectives:

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

Design for Walls

Teaching Aids : white board,

Different colour markers Teaching Points :

Design for raft, stepped, circular footings

Assignment / Questions:

1. List out various types of foundations and explain their design procedures in detail while going for Formwork. CO 2, BL 2

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 5/21/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:16 Duration of Lesson: 1hr

Lesson Title: Design for Walls

Instructional/Lesson Objectives:

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

1. Differentiate conventional and proprietory wall formwork system.

Teaching Aids : white board,

Different colour markers Teaching Points :

Concepts and differences in conventional and proprietory wall formwork system.

Assignment / Questions:

1. Distinguish between conventional and proprietory wall formwork system. CO 2, BL 2
2. Explain briefly about climbing wall form work system. CO 2, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/21/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:18		Duration of Lesson: 1hr

Lesson Title: Design for Columns

Instructional/Lesson Objectives:

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

Distinguish various types of column form work like conventional, proprietory, L&T, DOKA.

Teaching Aids : white board,

Different colour markers Teaching Points :

Design for Columns in L&T, Conventional, proprietory, DOKA,.

Assignment / Questions:

1. Discuss the suitability and salient features of: (i) Traditional formwork; (ii) Proprietary formwork. CO 2, BL 3

2. List out the various advantages and types of disposable column formwork

CO 2, BL3

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 5/22/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:19 Duration of Lesson: 1hr

Lesson Title: Design for Columns

Instructional/Lesson Objectives:

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

1. Salient features of the following PERI column formworks: (a) Rapid column formwork; (b) Vario GT 24 column formwork; (c) Trio column formwork; (d) Qua ro column formwork; (e) SRS steel column formwork; (f) LICO light weight column formwork; (g) Vario Qua ro column formwork.

Teaching Aids : white board,

Different colour markers Teaching Points :

salient features of the following PERI column formworks

Assignment / Questions:

1. Compare and contrast the Doka and PERI column formwork systems. CO 2, BL 3
2. What measures should be adopted to achieve economy in column formwork construction?

CO 2, BL2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/22/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:20		Duration of Lesson: 1hr

Lesson Title: Slab and Beams

Instructional/Lesson Objectives:

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

Illustration of slab and beam formwork design.

Teaching Aids : white board,

Different colour markers Teaching Points :

Components and design of form work for slab and beams.

Assignment / Questions:

1. Prepare a summary report for L&T slab and beam formwork and discuss all the major characteristics of the system CO2, BL 3
2. Sequence the following in the context of slab and beam formwork design: (i) design of the sheathing; (ii) design of the primary beam;(iii) design of the secondary beam (joists); (iv) design of the shores/ props; (v) determine the material available for the sheathing, the joists, the stringer, the shores, and the bracings; (vi) estimate or the vertical and horizontal load; (vii) select the appropriate permissible stress and the section properties CO2, BL 4

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/24/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:21		Duration of Lesson: 1hr

Lesson Title: Formwork Design for Special Structures

Instructional/Lesson Objectives:

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

1. Shells and Domes design steps for formwork.

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction of domes and shells

Assignment / Questions:

1. Explain about construction of Elliptical Domes for Delhi Metro. CO 3, BL3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 5/28/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:22		Duration of Lesson: 1hr

Lesson Title: Formwork Design for Special Structures

Instructional/Lesson Objectives:

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

Formwork Design for Folded plates

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Design for Special Structures like insitu and pre cast folded plates.

Assignment / Questions:

1. Differentiate between Insitu and Precast folded plates design procedure in formwork.
   CO 3, BL 2

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 5/29/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:23 Duration of Lesson: 1hr

Lesson Title: Shells

Instructional/Lesson Objectives:

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

Design of shells

Teaching Aids : white board,

Different colour markers Teaching Points :

Design procedure for Shells

Assignment / Questions:

1. Mention in detail any one case study for design procedure of shells. CO 3, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/2/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:24		Duration of Lesson: 1hr

Lesson Title: Shells

Instructional/Lesson Objectives:

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

Case study for construction of shells in formwork.

Teaching Aids : white board,

Different colour markers Teaching Points :

Case studies in form work

Assignment / Questions:

1. Prepare a summary report on formwork issues involved in design of shells.
   CO 3, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/3/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:25		Duration of Lesson: 1hr

Lesson Title: Domes

Instructional/Lesson Objectives:

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

Understand Construction of types dome in project

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction of elliptical dome in DMRC project

Assignment / Questions:

1. Prepare a summary report on formwork issues involved in Construction of central secretariat rotary dome in DMRC project CO 3, BL 3

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 6/4/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:26 Duration of Lesson: 1hr

Lesson Title: Folded Plates

Instructional/Lesson Objectives:

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

Design of Folded Plates

Teaching Aids : white board,

Different colour markers Teaching Points :

Design procedure for Folded Plates with case studies.

Assignment / Questions:

1. Organize the sequence of steps followed in design of folded plates. CO3, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/9/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:27		Duration of Lesson: 1hr

Lesson Title: Folded Plates

Instructional/Lesson Objectives:

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

Design of Folded Plates

Teaching Aids : white board,

Different colour markers Teaching Points :

Insitu and Pre cast Folded Plates

Assignment / Questions:

1. Differentiate between Insitu and precast folded plates design in form work.
   CO 3, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/10/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:28		Duration of Lesson: 1hr

Lesson Title: Overhead Watertanks

Instructional/Lesson Objectives:

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

Overhead Watertanks construction

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction of formwork related to Overhead Watertanks

Assignment / Questions:

1. Prepare a summary report on formwork issues involved in Overhead Watertanks construction. CO 3, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/11/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:29		Duration of Lesson: 1hr

Lesson Title: Tower and Bridges

Instructional/Lesson Objectives:

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

Construction form work in Tower and Bridges

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction form work in Tower and Bridges

Assignment / Questions:

1. Elucidate the various steps involved in formwork construction of Tower and bridges.
   CO 3, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/13/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:30		Duration of Lesson: 1hr

Lesson Title: Tower and Bridges

Instructional/Lesson Objectives:

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

Construction of formwork in Tower and Bridges

Teaching Aids : white board,

Different colour markers Teaching Points :

Tower and Bridges formwork construction

Assignment / Questions:

1. Enunciate the following in the context of formwork for bridge railings /parapets/edge beams (a) Forms accessible from only one side (b) Forms accessible from both sides (c) Precast railings /parapets. (d) Proprietary system bridge edge beam formwork.

CO 3, BL 3

Signature of Faculty

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 6/14/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:31 Duration of Lesson: 1hr

Lesson Title: Flying Formwork

Instructional/Lesson Objectives:

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

Examples of Flying Formwork construction.

Teaching Aids : white board,

Different colour markers Teaching Points :

Aluminium, Symons type of Flying Formwork and design steps in construction.

Assignment / Questions:

1. Mention the advantages and limitations of Flying Formwork. CO 4, BL 2
2. Organize the sequentials steps for designing flying form work. CO 4, BL 3
3. List out the design issues, safety issues, operations hazards, and remedies for the flying formwork CO 4, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 6/20/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:32		Duration of Lesson: 1hr

Lesson Title: Table Form

Instructional/Lesson Objectives:

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

L&T Table Formwork.

Teaching Aids : white board,

Different colour markers Teaching Points :

Types of Table Formwork

Assignment / Questions:

1. Write short notes on: (a) L&T table formwork (b) PERI table formwork
   CO 4, BL 2

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 7/2/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:32 Duration of Lesson: 1hr

Lesson Title: Table Form

Instructional/Lesson Objectives:

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

Advantages and limitations of Table Form

Teaching Aids : white board,

Different colour markers Teaching Points :

Table Form advantages and limitations

Assignment / Questions:

1. List out the advantages and limitations of table formwork. CO 4, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/4/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:34		Duration of Lesson: 1hr

Lesson Title: Tunnel Form

Instructional/Lesson Objectives:

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

Construction sequence, advantages, limitations of Tunnel Form

Teaching Aids : white board,

Different colour markers Teaching Points :

Tunnel Formwork

Assignment / Questions:

1. List out the advantages, disadvantages, and limitations of the tunnel form.
   CO 4, BL 2
2. Prepare short notes for the two variants of tunnel form by Symons Corporation.
   CO 4, BL 2

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 7/5/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:35 Duration of Lesson: 1hr

Lesson Title: Tunnel Form

Instructional/Lesson Objectives:

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

Construction steps of Tunnel Form

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction of Tunnel Form

Assignment / Questions:

1. List out the different steps involved in the tunnel formwork cycle. CO 4, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/6/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:36		Duration of Lesson: 1hr

Lesson Title: Slip Form

Instructional/Lesson Objectives:

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

Construction, safety issues, operations in Slip Form

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction, safety issues, operations in Slip Form

Assignment / Questions:

1. Prepare short notes on (a) Chimney construction using slipform (b) Tall bridge pier construction using slipform (c) Columns, pylons, and tower construction using slipform (d) Elevator and stair core construction using slipform (e) Silos construction using slipform (f) Construction of RCC framed structures using slipform CO 4, BL 3
2. List out the safety issues involved in slipform erection. CO 4, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/7/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:37		Duration of Lesson: 1hr

Lesson Title: Slip Form

Instructional/Lesson Objectives:

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

Productivity issues in Slip Form

Teaching Aids : white board,

Different colour markers Teaching Points :

Productivity issues in Slip Form

Assignment / Questions:

1. Explain about the productivity issues in man-hours with respect to (a) Assembly and dismantling of slipform (b) Slipping operation (c) Concreting activities (d) Reinforcement

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/8/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:38		Duration of Lesson: 1hr

Lesson Title: Formwork for Precast Concrete

Instructional/Lesson Objectives:

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

Formwork for Precast Concrete

Teaching Aids : white board,

Different colour markers Teaching Points :

Construction, advantages, limitations of Formwork for Precast Concrete

Assignment / Questions:

1. Write short notes on precasting processes associated with the following projects: (a) Parliament library building precast waffle slab and bubble dome (b) Folded plates for ITC Saharanpur (c) I-Girder for Nizamuddin bridge and Dwarka flyover (d) Dome elements for the stadium project at Bangalore (e) DMRC tunnel elements

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/19/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:39		Duration of Lesson: 1hr

Lesson Title: Formwork for Precast Concrete

Instructional/Lesson Objectives:

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

Formwork for Precast Concrete

Teaching Aids : white board,

Different colour markers Teaching Points :

The differences in moulds used for pre casting and in-situ construction.

Assignment / Questions:

1. List out the differences in moulds used for pre casting and in-situ construction. CO 4, BL2
2. Discuss in detail the various precasting processes. CO 4, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/20/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:40		Duration of Lesson: 1hr

Lesson Title: Formwork Management Issues

Instructional/Lesson Objectives:

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

Pre award Formwork Management Issues

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Management Issues

Assignment / Questions:

1. Discuss the pre-award formwork management CO 4, BL2
2. List out the different features involved in preparation and finalization of formwork scheme

CO 4, BL2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/21/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:41		Duration of Lesson: 1hr

Lesson Title: Formwork Management Issues

Instructional/Lesson Objectives:

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

Post award Formwork Management Issues

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Management Issues

Assignment / Questions:

1. Discuss the different steps involved in formwork management in post-award stage. CO 4, BL 2
2. List out the various responsibilities of the formwork engineer located at the sites. CO 4, BL1

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/26/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:42		Duration of Lesson: 1hr

Lesson Title: Pre- and Post-Award

Instructional/Lesson Objectives:

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

Pre- and Post-Award

Teaching Aids : white board,

Different colour markers Teaching Points :

Pre- and Post-Award

Assignment / Questions:

1. Explain about Pre- and Post-Award management issues.

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/28/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:43		Duration of Lesson: 1hr

Lesson Title: Pre- and Post-Award

Instructional/Lesson Objectives:

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

Pre- and Post-Award

Teaching Aids : white board,

Different colour markers Teaching Points :

Pre- and Post-Award

Assignment / Questions:

1. Sequence the following in the context of tasks involved in post-contract award formwork management. (i) Training subcontractors and workers (ii) Monitoring of formwork cost (iii) Periodical reconciliation of formwork materials (iv) Preparation of demobilization schedule of formwork materials (v) Upkeep/maintenance of formwork materials (vi) Preparation and finalization of formwork scheme (vii) Preparation of mock-up for various formwork systems (viii) Preparation of mobilization schedule for formwork materials (ix) Ensuring effective and proper utilization of formwork materials (x) Detailed planning (xi) Preparation of schedules of formwork activities based on the project schedule CO 5, BL 3

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 7/30/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:44		Duration of Lesson: 1hr

Lesson Title: Formwork Failures

Instructional/Lesson Objectives:

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

Formwork Failures

Teaching Aids : white board,

Different colour markers Teaching Points :

Reasons and deficiencies in Formwork Failures

Assignment / Questions:

1. List out the various reasons for formwork failure. CO 5, BL 2
2. List out the various deficiencies in design leading to formwork failure.CO 5, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 8/2/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:45		Duration of Lesson: 1hr

Lesson Title: Formwork Failures

Instructional/Lesson Objectives:

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

Formwork Failures

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Failures

Assignment / Questions:

1. List out the various recommendations as per OSHA, ACI for safety in formwork. CO 5, BL 2
2. Examine the various checklists to ascertain safety during formwork/scaffold, CO 5, BL 4

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 8/3/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:1		Duration of Lesson: 1hr

Lesson Title: Causes and Case studies in Formwork Failure

Instructional/Lesson Objectives:

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

Causes and Case studies in Formwork Failure

Teaching Aids : white board,

Different colour markers Teaching Points :

Causes and Case studies in Formwork Failure

Assignment / Questions:

1. Causes and Case studies in Formwork Failure CO 5, BL 3

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 8/4/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:1 Duration of Lesson: 1hr

Lesson Title: Causes and Case studies in Formwork Failure

Instructional/Lesson Objectives:

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

Causes and Case studies in Formwork Failure

Teaching Aids : white board,

Different colour markers Teaching Points :

Causes and Case studies in Formwork Failure

Assignment / Questions:

1. Causes and Case studies in Formwork Failure CO 5, BL 3

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 8/6/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:48 Duration of Lesson: 1hr

Lesson Title: Causes and Case studies in Formwork Failure

Instructional/Lesson Objectives:

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

Causes and Case studies in Formwork Failure

Teaching Aids : white board,

Different colour markers Teaching Points :

Causes and Case studies in Formwork Failure

Assignment / Questions:

1. Causes and Case studies in Formwork Failure CO 5, BL 3

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 8/9/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:49 Duration of Lesson: 1hr

Lesson Title: Formwork Issues in Multi Story Building Construction

Instructional/Lesson Objectives:

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

Formwork Issues in Multi Story Building Construction

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Issues in Multi Story Building Construction

Assignment / Questions:

1. Elucidate the techniques in Multi Story RC Construction. CO 5, BL 2
2. Diferentiate Shoring, Preshoring and Reshoring CO 5, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 8/10/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:50		Duration of Lesson: 1hr

Lesson Title: Formwork Issues in Multi Story Building Construction

Instructional/Lesson Objectives:

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

Formwork Issues in Multi Story Building Construction

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Issues in Multi Story Building Construction

Assignment / Questions:

1. Explain about various loads on Multi Story Building Construction CO 5, BL 2

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LESSON PLAN

Academic **Y**ear	: 2021-22	Date: 8/11/2022
Semester	: I Year II Semester	
Name of the Program	: M.Tech	Section : A
Course/Subject	: Design of Formwork	Course Code: GR20D5015
Name of the Faculty	: Mrs K Hemalatha	
Designation	: Asst. Professor	
Lesson No:51		Duration of Lesson: 1hr

Lesson Title: Formwork Issues in Multi Story Building Construction

Instructional/Lesson Objectives:

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

Formwork Issues in Multi Story Building Construction

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Issues in Multi Story Building Construction

Assignment / Questions:

1. Illustrate the Formwork Issues in Multi Story Building Construction

CO5, BL 3

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LESSON PLAN

Academic **Y**ear : 2021-22 Date: 8/13/2022

Semester : I Year II Semester

Name of the Program : M.Tech Section : A

Course/Subject : Design of Formwork Course Code: GR20D5015

Name of the Faculty : Mrs K Hemalatha

Designation : Asst. Professor

Lesson No:52 Duration of Lesson: 1hr

Lesson Title: Formwork Issues in Multi Story Building Construction

Instructional/Lesson Objectives:

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

Formwork Issues in Multi Story Building Construction

Teaching Aids : white board,

Different colour markers Teaching Points :

Formwork Issues in Multi Story Building Construction

Assignment / Questions:

1. Slab thickness = 200 mm; it is assumed that Type I cement is used and concrete curing temperature = 12.8°C, The concrete is designed to carry a live load of 2.4 kN/m2 and 0.72 kN/m2 for mechanical systems and partitions CO 5, BL 4

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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
COURSE COMPLETION STATUS

Academic Year :2021-22
Semester II
Name of the Program: M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

Units	**Remarks**	**No. of Objectives Achieved**	**No. of Outcomes Achieved**
Unit I	Covered on time	1	1
Unit II	Covered on time	1	1
Unit III	Covered on time	1	1
Unit IV	Covered on time	1	1
Unit V	Covered on time	1	1

Signature of HOD Signature of Faculty

Date: Date:

Gokaraju Rangaraju Institute of Engineering and Technology
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DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
EVALUATION STRATEGY

Academic Year :2021-22
Semester II
Name of the Program: M.Tech Year: I YEAR
Course : Design of Formwork Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha Dept: Civil Engineering
Designation : Assistant Professor

1. Target:

A. Percentage for pass : 90%

Total Strength of the class: 21

S.No.	Class / Division	No. of students
1	First class with distinction	15
2	First class	3
3	Pass class	3

2. COURSE PLAN & CONTENT DELIVERY

S.No.	Plan	Brief Description
1	Practice classes	48 classes for A section
2	Design of Lecture classes	Bringing Requirements and Selection of Formwork, Formwork MaterialsTimber, Plywood, Steel, Aluminium, Plastic, and Accessories. Horizontal And Vertical Formwork Supports
3	Design of Practice classes	Exercises in Concepts, Formwork Systems and Design for Foundations, Walls, Columns, Slab and Beams.
5	Assignments	Assignments are designed mostly on problematic and understanding basis
6	Demonstration	Designing, assembling and analyzing real time projects

3. METHOD OF EVALUATION

3.1. Continuous Assessment examinations (CAE-I, CAE-I)

1. **Assignments:** Assignments are mainly regarding problems on corrections while doing chain Design of Formwork, leveling, tachometry and final marks will be 40% based on procedure and 60% on output
2. **Practical projects:** Assessing the skills of the students in applying their knowledge to practical application
3. **Viva:** Assessing the overall knowledge of the student in Design of Formwork
4. **Internal Examination**: Internal Examination to assess their overall knowledge on Theodolite and Total Station.

3.2. **Semester / End Examination:** To test their abilities in using Theodolite and Total Station and to approve their abilities learnt during lab sessions.

Signature of HOD

Date:

Signature of Faculty

Date:

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Bachupally, Hyderabad-500090

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

Assessments in Relation to CO's and COB's

Assessments: 1. Assignment
2. Internal Examination
3. External Examination

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

Mappings of COBs, COs vs POs, POBs

Course Objectives – Course Outcomes Relationship Matrix

Course -outcomes / Course Objectives	1	2	3	4	5
1	X				
2	X				
3		X	X		
4				X	
5					X

Course Outcomes – Program Outcomes Relation (Contributions: High, Medium and Low)

		Course Outcomes	1	2	3	4	5	6
GR20D5015	**Design of Formwork**	Understand the necessity and types of form work for various structures of civil Engineering and select proper type of form work, accessories and materials required.	M	M		M	M	M
		Design the form work for various structural elements like beam, slab, column, wall and foundation.	M	H		M	M	M
		Design the form work for special structures like shells, retaining walls, bridges, Sylos, bunkers & water tank.	H	H		M	M	M
		Understand the working of flying form work like tunnel forms, slip forms and table forms.	H	H		M	M	M
		Judge the form work failures from case studies.	M	M		H	M	M

Course Objectives – Program Outcomes (POs) Relationship Matrix

Program Outcomes / Course Objectives	1	2	3	4	5	6
1	X	X		X	X	X
2	X	X		X	X	X
3	X	X		X	X	X
4	X	X		X	X	X
5	X	X		X	X	X

Course Outcomes – Program Outcomes (POs) Relationship Matrix

Program -Outcomes / Course-Outcomes	1	2	3	4	5	6
1	X	X		X	X	X
2	X	X		X	X	X
3	X	X		X	X	X
4	X	X		X	X	X
5	X	X		X	X	X

Courses (with title & code) – Program Outcomes (POs) Relationship Matrix

Course: Design of Formwork

Program -Outcomes / Courses	1	2	3	4	5	6
1	X		X	X	X	X

Program Educational Objectives (PEOs) – Program Outcomes Relationship Matrix

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

Gokaraju Rangaraju Institute of Engineering and Technology
(Autonomous)
Bachupally, Hyderabad-500090
DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

ASSIGNMENT I

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

This assignment corresponds to Unit No. I

Q1. Explain Requirements of formwork COb 1,2, CO 1, K2

Q2. Explain formwork materials COb 1,2, CO 1, K2

Q3. Explain Steel and Aluminium formwork COb 1,2, CO 1, K2

Q4. Summarize briefly about selection of Formwork COb 1,2, CO 1,K3

Signature of HOD

Signature of faculty

Date:

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

TUTORIAL SHEET I

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

1. Outline the following terms:
   a) Sheathing b) Scaffolding c) Centering d) False work CO 1, BL 1

2. Explain about the requirements for Formwork in detail. CO 1, BL2

3. Explain about the Job specifications in detail to select the formwork. CO 1, BL 2

4. Mention the local conditions to follow in selecting Formwork. CO 1, BL 2

Signature of HOD Signature of faculty

Date: Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

ASSIGNMENT II

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

This assignment corresponds to Unit No. II

Q1. Write about design procedure for foundation walls. COb 3, CO 2, K3

Q2. Organize the design procedure for slabs and beams. COb 3, CO 2, K3

Q3. Examine the design inputs and salient features of L&T wall formwork and PERI wall formwork COb 3, CO 2, K4

.

Signature of HOD

Date:

Signature of faculty

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

TUTORIAL SHEET II

1. Elucidate the various factors affecting Lateral pressure as per ACI formula, IS code. CO 2, BL 3
2. Estimate the total load exerted on the formwork of a RCC slab of thickness 250 mm. Assume a live load of 2.4 kN/m2 and self-weight of forms as 0.4 kN/m2. CO 2, BL 4
3. Organize the sequence of steps to characterize the procedure for isolated footings. CO 2, BL 2
4. Elucidate the different steps in foundation wall. CO 2, BL 2

Signature of HOD Signature of faculty

Date: Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

ASSIGNMENT III

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

This assignment corresponds to Unit No. III

Q1. Write about shells and domes construction sequence COb 3, CO 3, K3

Q2. Explain Natural Draft Cooling Tower and Bridges steps in form work construction. COb 3, CO 3, K3

Q3. Mention various types of Special structures and explain the importance of any two. COb 3, CO 3, K3

Signature of HOD

Signature of faculty

Date:

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

TUTORIAL SHEET III

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

1. Differentiate between Insitu and Precast folded plates design procedure in formwork. CO 3, BL 2

2. Prepare a summary report on formwork issues involved in Construction of central secretariat rotary dome in DMRC project CO 3, BL 3

3. Differentiate between Insitu and precast folded plates design in form work. CO 3, BL 3

4. Elucidate the various steps involved in formwork construction of Tower and bridges. CO 3, BL 3

Signature of HOD

Date:

Signature of faculty

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

ASSIGNMENT IV

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

This assignment corresponds to Unit No. IV

Q1. Explain Table form and its advantages	COb 4, CO 4, K3
Q2. Discuss Pre and Post-Award	COb 4, CO 4,K3
Q3. Explain Formwork Management Issues	COb 4, CO 4,K3

.

Signature of HOD

Date:

Signature of faculty

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

TUTORIAL SHEET IV

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

1. Organize the sequential steps for designing flying form work. CO 4, BL 3
2. Write short notes on: (a) L&T table formwork (b) PERI table formwork CO 4, BL 2
3. Prepare short notes for the two variants of tunnel form by Symons Corporation. CO4, BL 3
4. List out the different steps involved in the tunnel formwork cycle. CO 4, BL 2

Signature of HOD Signature of faculty

Date: Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

ASSIGNMENT V

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

This assignment corresponds to Unit No. V

Q1. Explain Causes and Case studies in Formwork Failure COb 5, CO 5, K4

Q2. Explain Formwork Issues in Multi Story Building Construction. COb 5, CO 5, K3

Q3. Inspect the analysis of risks associated with various construction activities and why formwork failures are important. COb 5, CO 5, K4

Signature of HOD

Signature of faculty

Date:

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

TUTORIAL SHEET V

Academic Year	:2021-22	
Semester	:II	
Name of the Program	: M.Tech	Year: I YEAR
Course	: Design of Formwork	Course Code: GR20D5015
Name of the faculty	: Mrs K Hemalatha	Dept: Civil Engineering
Designation	: Assistant Professor	

1. List out the various deficiencies in design leading to formwork failure. CO 5, BL 2
2. Examine the various checklists to ascertain safety during formwork/scaffold, CO 5, BL 4
3. Causes and Case studies in Formwork Failure CO 5, BL 3
4. Elucidate the techniques in Multi Story RC Construction. CO 5, BL 2

Signature of HOD

Date:

Signature of faculty

Date:

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

DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)

Rubrics

Academic Year :2021-22
Semester :II
Name of the Program : M.Tech — Year: I YEAR
Course : Design of Formwork — Course Code: GR20D5015
Name of the faculty : Mrs K Hemalatha — Dept: Civil Engineering
Designation : Assistant Professor

Name of the Student	Performance Criteria	Beginning	Developing	Reflecting Development	Accomplished	Exemplary	Score
		1	2	3	4	5	
21241A0107	Level of knowledge on basics of Design of Formwork.	Low level of knowledge on different basic concepts such as determining relative positions	Able to understand the different method of Design of Formwork	Finding the precision of the particular method in comparison to the others	Checking out the corrections to be applied	Coming up with a correct output with utmost accuracy	5
	Level of knowledge on the application of the learnt method	Identify the purpose of the instrument	Selecting the method appropriately	Able to apply the principle of the appropriate method	Able to follow the complete step by step procedure	Obtaining the correct solution without errors	4
	Level of knowledge on Interpreting the solutions in the data book	Able to recognize the data given the problem	Taking care of units for each and every entity given in the data	Doing proper calculations to get the end result	Accuracy of the results. Corrected values up to three decimals	Final interpretation of the values in a tabular column	3
						Average Score	4

Name of the Student	Performance Criteria	Beginning	Developing	Reflecting Development	Accomplished	Exemplary	Score
		1	2	3	4	5	
21241A0103	Level of knowledge on basics of Design of Formwork.	Low level of knowledge on different basic concepts such as determining relative positions	Able to understand the different method of Design of Formwork	Finding the precision of the particular method in comparison to the others	Checking out the corrections to be applied	Coming up with a correct output with utmost accuracy	4
	Level of knowledge on the application of the learnt method	Identify the purpose of the instrument	Selecting the method appropriately	Able to apply the principle of the appropriate method	Able to follow the complete step by step procedure	Obtaining the correct solution without errors	3
	Level of knowledge on Interpreting the solutions in the data book	Able to recognize the data given the problem	Taking care of units for each and every entity given in the data	Doing proper calculations to get the end result	Accuracy of the results. Corrected values up to three decimals	Final interpretation of the values in a tabular column	2
						Average Score	3

Name of the Student	Performance Criteria	Beginning	Developing	Reflecting Development	Accomplished	Exemplary	Score
		1	2	3	4	5	
21241A0113	Level of knowledge on basics of Design of Formwork.	Low level of knowledge on different basic concepts such as determining relative positions	Able to understand the different method of Design of Formwork	Finding the precision of the particular method in comparison to the others	Checking out the corrections to be applied	Coming up with a correct output with utmost accuracy	3
	Level of knowledge on the application of the learnt method	Identify the purpose of the instrument	Selecting the method appropriately	Able to apply the principle of the appropriate method	Able to follow the complete step by step procedure	Obtaining the correct solution without errors	2
	Level of knowledge on Interpreting the solutions in the data book	Able to recognize the data given the problem	Taking care of units for each and every entity given in the data	Doing proper calculations to get the end result	Accuracy of the results. Corrected values up to three decimals	Final interpretation of the values in a tabular column	1
						Average Score	2

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering
I M.Tech. II Semester Mid I Examination June 2022

Design of Formwork (GR20D5015)

Time: 75 Minutes **Date of examination 08-06-2022** **Max.Marks: 15 Marks**

Answer all questions.

Question	M	CO	BL	PI
1. Explain in detail about following formwork materials Timber, Plywood and Aluminum	**5**	**1**	**2**	**1.2.1**
Or				
2. Summarize briefly about selection of Formwork	**5**	**1**	**2**	**3.1.1**
3. Examine the design inputs and salient features of L&T wall formwork and PERI wall formwork	**5**	**2**	**4**	**3.1.2**
OR				
4. Simplify the lateral pressure on formwork for a 3.0 m high wall where ordinary concrete is to be placed at 10°C progressively over a 1 hour period. The following inputs may be taken for the design: C1 Shape co-efficient 1.0 C2 Material co-efficient 0.3 D Concrete density 25 kN/m3 H Vertical height of form 3 m	**5**	**2**	**4**	**3.2.1**
5. Identify the various design inputs and steps for Foundation Wall formwork design	**5**	**3**	**3**	**3.1.3**
OR				
6. Organize the sequence of steps for design of formwork for slabs	**5**	**2**	**3**	**1.1.1**

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)
Department of Civil Engineering
I M. Tech II Semester MID I EXAMINATION June 2022

Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of examination 08-06-22** **Max.Marks: 5 Marks**

Name :_____ **Roll No.** | | | | | | D | | | | |

1. The temporary casing is known as the_____ [ ]
a) Support b)Formwork
c) Built up d) Casing
2. Forms whose components can be reused several times are known as the [ ]
a) Stripping b) Panel forms
c)Newel Forms d)shuttering
3. The_____of formwork plays a significant role in the cost of concrete. [ ]
a)Conditions b)Work
c) Period d) Economy
4. The formwork should be sufficiently strong enough to bear the_____of weight concrete as well as the weights of the equipment, labour etc., [ ]
a) Live Load b)Dead load
c)Wind load d) Snow load
5. The inside surface of formwork should be_____so as to turn out a good concrete surface
a) Smooth b)Undulated [ ]
c) Rough d) Geometrica
6. The_____formwork is used for formwork when it is desired to reuse the formwork several times. [ ]
a) Wooden b) Timber
c) Steel d) Custom
7. The column formwork consists of a box prepared from_____separate sides.
a) One b) Two [ ]
c)Three d) Four
8. The form work for an RCC floor consists of a_____to receive the concrete
a) Block b) Skeleton .[ ]
c) Trap d) Beam
9. The boxes for beams are play prepared from__sides and __bottom in formwork for an RCC Floor [ ]
a) One,one b) Two, Two
c)One, Two d) Two, One
10. In formwork for the wall, they_____are provided by vertical Struts and horizontal wales.
a) Studs b) Wales [ ]
c)Sheets d) Ties

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering

I M.Tech. II Semester Mid II Examination June 2022

Design of Formwork (GR20D5015)

Time: 75 Minutes **Date of examination 17-08-2022** **Max.Marks: 15 Marks**

Answer all questions.

Part-B

	M	CO	BL	PI
1.Identify the formwork issues involved in construction of Dome roof of a Reactor building	5	3	3	5.1.1
OR				
2. Identify various features of formwork arrangements in Pre-cast folded plates and cast-in-situ folded plates.	5	3	3	6.1.1
3. Organize different steps involved in flying formwork cycle and mention their limitations.	5	4	3	5.2.1
OR				
4. Categorize the moulds used for precasting, in-situ construction and discuss various precasting processes.	5	4	4	3.2.2
5. Inspect the analysis of risks associated with various construction activities and why formwork failures are important.	5	5	4	4.1.1
OR				
6. Examine various Formwork Issues in Multi Story Building Construction.	5	5	4	5.2.2

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)Department of Civil Engineering

I M. Tech II Semester MID II EXAMINATION June 2022

Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of examination 17-08-22** **Max.Marks: 5 Marks**

Name :_____ **Roll No.** | | | | | | D | | | | |

1. The_____is used for formwork when it is desired to reuse the formwork several times. [ ]

a) Stone b) Steel c) Timber d) Bamboo

2. _____ gives excellent exposed concrete surface requiring no further finishing treatment. [ ]

a) Timber b) Teak wood c) Steel d) Fibre glass

3. When form work is required for small ones requiring less repetitions, the_____is preferred to Steel. [ ]

a) Steel b) Timber c) Fibre glass d) Metal sheets

4. The_____formwork should be neither too dry nor too wet.

a) Fibre glass b) Steel c) Timber d) Metal [ ]

5. It is found that moisture content of about_____is appropriate for the timber formwork. [ ]

a) 20% b) 30% c)40% d)50%

6. The_____formwork can be reused several time as compared to ordinary Timber formwork. [ ]

a) Sunmica b) Plywood c) Fibre ply d) Cardboard

7. The column formwork consists of a box prepared from_____separate sides.

a) One b) Two c) Three d) Four [ ]

8. The formwork for an_____consists of rows of the vertical post which carry small wooden beams at their tops [ ]

a) RCC floors b) RCC slab c) RCC column d) RCC beam

9. In case of formwork for the floor, the_____supports should be firmly supported at the bottom [ ]

a) Horizontal b) Vertical c) Inclined d)Slanting

10. The formwork for_____consists of stringers, sheets, joist, bearers and vertical post. [ ]

a) Walls b) Column c) Beams d) Stairs

Gokaraju Rangaraju Institute of Engineering and Technology
(Autonomous)
Bachupally, Hyderabad-500090
DEPARTMENT OF CIVIL ENGINEERING (STRUCTURAL ENGINEERING)
I Year II Semester Mid Examination Marks
Subject: Design of Formwork

S.No	Roll No	MID-I Marks	MID-II Marks	Tutorial Marks	Assessment Marks	Sessional Marks
1	21241D2001	13	13	2	2	17
2	21241D2002	16	12	4	4	22
3	21241D2003	16	11	4	4	22
4	21241D2004	13	16	5	2	22
5	21241D2005	19	15	4	4	25
6	21241D2006	18	16	4	4	25
7	21241D2007	13	15	4	5	23
8	21241D2008	12	15	4	4	22
9	21241D2009	16	17	4	5	26
10	21241D2010	16	16	2	2	20
11	21241D2011	17	13	4	5	24
12	21241D2012	13	15	5	2	21
13	21241D2013	14	11	4	4	21
14	21241D2014	13	13	4	5	22
15	21241D2015	17	16	4	5	26
16	21241D2016	19	15	4	4	25
17	21241D2017	11	10	4	5	20
18	21241D2018	12	AB	2	2	10
19	21241D2019	AB	AB	2	1	3
20	21241D2020	11	12	2	1	15
21	21241D2021	13	10	2	1	15

GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

(Autonomous)

Department of Civil Engineering

STRUCTURAL ENGINEERING

I M.Tech II Semester Mid I Examination, June 2022 Attendance Sheet

Sub: Design of Formwork **2021-22 AY**

Room No: 4112 **Date: 08-06-2022(FN)**

S.No	ROLL NUMBER	NAME OF THE STUDENT	Booklet No	Signature
1	21241D2001	A Prashanth	455896	
2	21241D2002	B Sri Ram Gopal	447168	
3	21241D2003	Ch Madhavi	447169	
4	21241D2004	P Divya	459168	
5	21241D2005	D Umesh Kumar	447171	
6	21241D2006	K Lathasree	447172	K. Latha Sree
7	21241D2007	M Vaishnavi	447173	
8	21241D2008	M Pranav	447174	
9	21241D2009	M Naga Ashwini	447175	
10	21241D2010	R Venkata Suraj Reddy	447176	
11	21241D2011	R Mohan Babu	447177	
12	21241D2012	Sandhya Cheruku	447178	
13	21241D2013	Shaik Feroz	447179	
14	21241D2014	SK Sai Chandra	447180	
15	21241D2015	T Harshavardhan	447181	
16	21241D2016	V Lalitha	447182	
17	21241D2017	Y Rama Ghanendra Sai	447183	
18	21241D2018	Y Devesh Goud	447184	
19	21241D2019	S Prashanth Kumar	ABSENT	
20	21241D2020	B Tharun Teja	394578	
21	21241D2021	G Nitish Kumar	459169	

No of Students Present: 20

No of Students Absent: 01

Total No of Students: 21

Faculty Signature

Gokaraju Rangaraju Institute of Engineering & Technology

Department of Civil Engineering

M.Tech. (Structural Engineering) I Year II Semester

2021-23 Admitted Batch (GR20)

Mid-II Examination

Attendance Sheet

Course Code: GR20D5015

Course Title: Design of Formwork

S.No	ROLL NUMBER	NAME OF THE STUDENT	Booklet No	Signature	Masrks(20)
1	21241D2001	ATKAPURAM PRASHANTH	459126		13
2	21241D2002	BANDI SRI RAM GOPAL	459159		12
3	21241D2003	CHALLA MADHAVI	459164		11
4	21241D2004	PAMMI DIVYA	459163		16
5	21241D2005	DUMMA UMESH KUMAR	459151		15
6	21241D2006	K LATHASREE	459161		16
7	21241D2007	MARIYALA VAISHNAVI	459150		15
8	21241D2008	MAVOORI PRANAV	459154		15
9	21241D2009	MITTAPALLI NAGA ASHWINI	459165		17
10	21241D2010	RAVULA VENKATA SURAJ REDDY	459149		16
11	21241D2011	REPATI MOHAN BABU	459160		13
12	21241D2012	SANDHYA CHERUKU	459162		15
13	21241D2013	SHAIK FEROZ	459155		11
14	21241D2014	SK SAI CHANDRA	459153		13
15	21241D2015	THOTA HARSHAVARDHAN	459127		16
16	21241D2016	VARIKUPPALA LALITHA	459157		15
17	21241D2017	YAMBA RAMA GNANENDRA SAI	459152		10
18	21241D2018	YENUMALA DEVESH GOUD	ABSENT		
19	21241D2019	S PRASHANTH KUMAR	ABSENT		
20	21241D2020	BAVANDLAPELLI THARUN TEJA	459158		12
21	21241D2021	G NITISH KUMAR	459156		16

No of Absent: 02
No of Present: 19
Total No of Students: 21

(1650)
17/8/22
Signature of the Staff Member

P. Divya

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

I M. Tech II Semester MID I EXAMINATION June 2022

Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of Exam 08-06-22** **Max.Marks: 5 Marks**

Name : P. Divya **Roll No.** 21241d2004

1. The temporary casing is known as the _____ [b]
a) Support b)Formwork c) Built up d) Casing

2. Forms whose components can be reused several times are known as the [d]
a) Stripping b) Panel forms c)NewelForms d)shuttering

3. The _____ of formwork plays a significant role in the cost of concrete. [d]
a)Conditions b)Work c) Period d) Economy

4. The formwork should be sufficiently strong enough to bear the _____ of weight concrete as well as the weights of the equipment, labour etc., [a]
a) Live Load b)Dead load c)Wind load d) Snow load

5. The inside surface of formwork should be _____ so as to turn out a good concrete surface [a]
a) Smooth b)Undulated c) Rough d) Geometrica

6. The _____formwork is used for formwork when it is desired to reuse the formwork several times. [c]
a)Wooden b)Timber c) Steel d)Custom

7. The column formwork consists of a box prepared from _____ separate sides. [d]
a) One b) Two c)Three d) Four

8. The form work for an RCC floor consists of a _____ to receive the concrete .[b]
a) Block b) Skeleton c) Trap d) Beam

9. The boxes for beams are play prepared from __sides and __bottom in formwork for an RCC Floor [d]
a) One,one b) Two, Two c)One, Two d) Two, One

10. In formwork for the wall, they _____ are provided by vertical Struts and horizontal wales. [c]
a) Studs b) Wales c)Sheets d) Ties

2/12/5 K. Latha.

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

I M. Tech II Semester MID I EXAMINATION June 2022

Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of Exam 08-06-22** **Max.Marks: 5 Marks**

Name : K. Latha Sree **Roll No.** 21241D2006

1. The temporary casing is known as the _____ [b]
a) Support b)Formwork c) Built up d) Casing

2. Forms whose components can be reused several times are known as the [d]
a) Stripping b) Panel forms c)NewelForms d)shuttering

3. The _____ of formwork plays a significant role in the cost of concrete. [d]
a)Conditions b)Work c) Period d) Economy

4. The formwork should be sufficiently strong enough to bear the _____ of weight concrete as well as the weights of the equipment, labour etc., [a]
a) Live Load b)Dead load c)Wind load d) Snow load

5. The inside surface of formwork should be _____ so as to turn out a good concrete surface [a]
a) Smooth b)Undulated c) Rough d) Geometrica

6. The _____formwork is used for formwork when it is desired to reuse the formwork several times. [c]
a)Wooden b)Timber c) Steel d)Custom

7. The column formwork consists of a box prepared from _____ separate sides. [d]
a) One b) Two c)Three d) Four

8. The form work for an RCC floor consists of a _____ to receive the concrete [a]
a) Block b) Skeleton c) Trap d) Beam

9. The boxes for beams are play prepared from __sides and __bottom in formwork for an RCC Floor [d]
a) One,one b) Two, Two c)One, Two d) Two, One

10. In formwork for the wall, they _____ are provided by vertical Struts and horizontal wales. [b]
a) Studs b) Wales c)Sheets d) Ties

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Bachupally, Kukatpally, Hyderabad - 500090

I	II	MID TERM EXAMINATION

No. H.T. No. 2 1 2 4 1 D 2 0 0 6

Name of the Examination 997172 M.Tech 1st year II Sem I st mid examination

Course Design of formwork Branch Structural Engineering Date 8/06/2024

Signature of the Invigilator

Q.NO.	1		2		3		4		5		6		TOTAL
	a	b	a	b	a	b	a	b	a	b	a	b	
MARKS			5				5		5				15/20

K. Lathasri

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2Ans:- Selection of formwork:-

1) The Selection of formwork consists of two methods for Safe Construction of a Building or other Structural Buildings.

a) Quantative formwork

b) Qualitative formwork.

a) Quantative formwork :-

In Quantative formwork taking the safety measures like "cost" and the "construction time"

→ Cost plays a major role on designing of a building. The cost of formwork with respect to concrete is 35 to 50% of the formwork and the cost of formwork with concrete as well as Rcc reinforcement is 50 to 75% of the formwork. formwork plays a major role in design of a building and cost also plays a major role.

→ Construction time of formwork also part in a deconstruction of structual members. The mantel & dismantling of formwork and for construction the member should be in correct shape, size and allow all the permissible loads on the member by avoiding undulations of beam, screening and bulging of concrete. &

Honey combs & also improper vibration of a member these are the defects can be seen in the construction time of a structural member.

b) Qualitative formwork :-

Qualitative formwork also play an key role in construction of a structural member. In Qualitative the important measures to be taken such as construction familarities, flexiability Quality & Economy. These are the Qualitative formwork which are considered as Important.

Construction familalites is defined as the labour & skilled person should be selected for preparing the formwork. The construction of a member depends on the formwork and pouring of a fresh concrete.

flexibility :- It is the method of treating the formwork very skilled manner in the presence of onsite the maintaining of flexibility of concrete

Quality :- In formwork the quality is must and should. Some of the quality formwor -ks are plywood, Timber, Steel, Aluminum and plastic forms.

Economy :- In Qualitative formwork the Economy 50 to 70% of formwork include in. Construction of a structural member for an High raised building.

This are the methods for an selection of formwork.

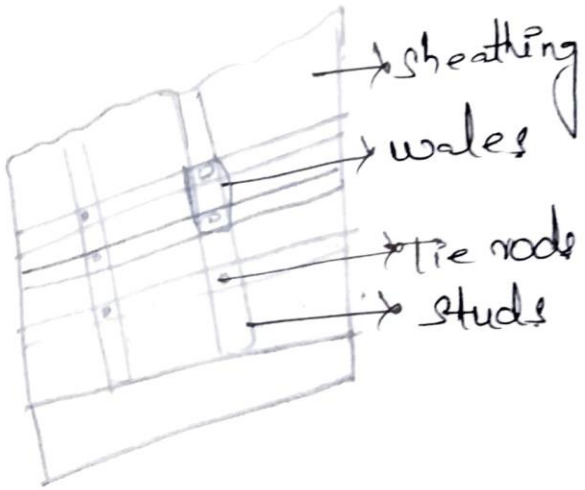
Ans:- Design Inputs and steps for foundation of wall formwork :-

For design of wall formwork one should follow the design Inputs and design steps for an wall foundation.

In design Inputs it includes the elements of an foundation of wall formwork.

→ The design elements of wall formwork Include;

1) Sheathing
2) Studs
3) wales
4) Tie rods
5) Alignment proofs.



The design steps of foundation of wall formwo.

→ ok

① Collecting all the formwork materials
② And Apply grease & oil to the formwork plates
③ And arrange all the plates (Sheathing / Shuttering) with the help of Scaffolding and with the help of Braces and Joints at the edges of the beams also pinned properly.

(4) And calculating the wall formwork design for lateral pressure.

As per ACI $P_{max} = C_w C_c \left[7.2 + \frac{1156}{T+76} + \frac{244R}{T+78} \right]$

As per CIRI $P_{max} = D \left[C_1\sqrt{R} + C_2 K \sqrt{H - C_1\sqrt{R}} \right]$

for wall lateral pressure

$$P_{max} = C_w C_c \left[7.2 + \frac{785R}{T+78} \right]$$

for height $(h_{max}) = \frac{P_{max}}{D}$ (Density of concrete)

These are the design steps for foundation of an wall formwork.

4301:- Given data

lateral pressure on formwork = 3.0m

Temperature for ordinary concrete = 10°c

Time period = 1 hr.

Shape coefficient $= 1.0$

material coefficient $= 0.3$

Concrete density $= 25\ kN/m^3$

H (vertical height of form) $= 3m$

Rate of pour concrete $= 3.m$

$$P_{max} = D\left[C_1\sqrt{R} + C_2 K\sqrt{H - C_1\sqrt{R}}\right]$$

$$= 25\left[1\times\sqrt{3} + 0.3\times1\sqrt{3 - 1\times\sqrt{3.0}}\right]$$

$$P_{max} = 51.74\ kN/m^3$$

$$h_{max} = \frac{P_{max}}{D}$$

$$= \frac{51.74}{25} = 2.0696\ m$$

$$P_{max} = C_w C_c\left[7.2 + \frac{1156}{T+7.6} + \frac{244R}{T+7.6}\right]$$

$$= 1\times0.3\left[7.2 + \frac{1156}{10+7.6} + \frac{244\times3}{10+7.6}\right]$$

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I	II

MID TERM EXAMINATION

No. 447173

H.T. No.	2	1	2	4	1	D	2	0	0	7

Name of the Examination I Mtech II sem I mid

Course DEW Branch STE Date 08/06/22

Signature of the Invigilator

Q.NO.	1		2		3		4		5		6		TOTAL
	a	b	a	b	a	b	a	b	a	b	a	b	
MARKS	5						5						10/14

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4. Given data.

C_1 – shape coefficient = 1

C_2 – Material coefficient = 0.3

D - Density = 25 kN/m³

H – Vertical height of form = 3m.

T – Temperature 10°C

t – time = 1 hr.

$$P_{max} = D \times \left[C_1 \times \sqrt{R} + K \cdot C_2 \cdot \sqrt{H - C_1 \sqrt{R}} \right]$$

(or)

$$D \times h$$

} min

R = Rate of rise

K = Temp. coeff

$$= \left(\frac{36}{T+16}\right) = \left(\frac{36}{10+16}\right) = 1.3846$$

Rate of rise = $\frac{\text{formwork height}}{\text{time}}$

$= \frac{3}{1} = 3 \text{ m/hr}$

$P_{max} = 25 \times \left[1 \times \sqrt{3} + 1.3846 \times 0.3 \times \sqrt{3 - 1 \times \sqrt{3}}\right]$

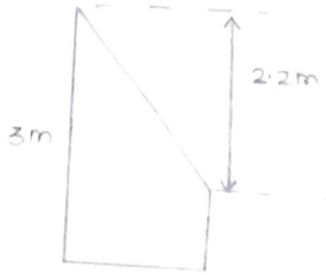
$= 54.994 \simeq \boxed{55.} \text{ KN/m}^2$

$P_{max} = D \times h$

$= 25 \times 3 = 75 \text{ KN/m}^2$

lateral pressure distribution = $\frac{P_{max}}{D}$

$= \frac{55}{25} = 2.2 \text{ m}.$



1. Formwork materials.

1) Timber- Timber is an old material used in the formwork since many years.

- The moisture content in timber should be 12 to 20%, it should not exceed this percentage, which may lead to weathering.
- The density of timber should be around 550kg/m^3.
- The timber should be free from "Hemicellulose" ie, wood sugar, it deteriates the timber.
- The timber should be strong enough to withhold the loads coming from concrete.

2.) Plywood: Plywood is mainly used in the sheathing formwork, as it give smooth finish (or) surface to the concrete.

- Plywood is only used for casing.
- It should be free from any type of weathering.
- It is economy and is easily available in market

3.) Aluminum. - It is mostly used in the pre-fabricated formwork.

- It cannot be reused for more than 100times and as compare to steel formwork
- It is bit costly compared to the other type of formwo

5. Various design steps for foundation wall formwork.

step-1.

Calculation of loads coming from the concrete. Depending on the loads dimensions of formwork are done.

step-2

Design of sheathing.

Based on load conditions sheathings are designed, their leng thickness and height

step-3

Design of studs

later studs are designed and spacing blw studs are calculated

step-4

Waler- Design of walers

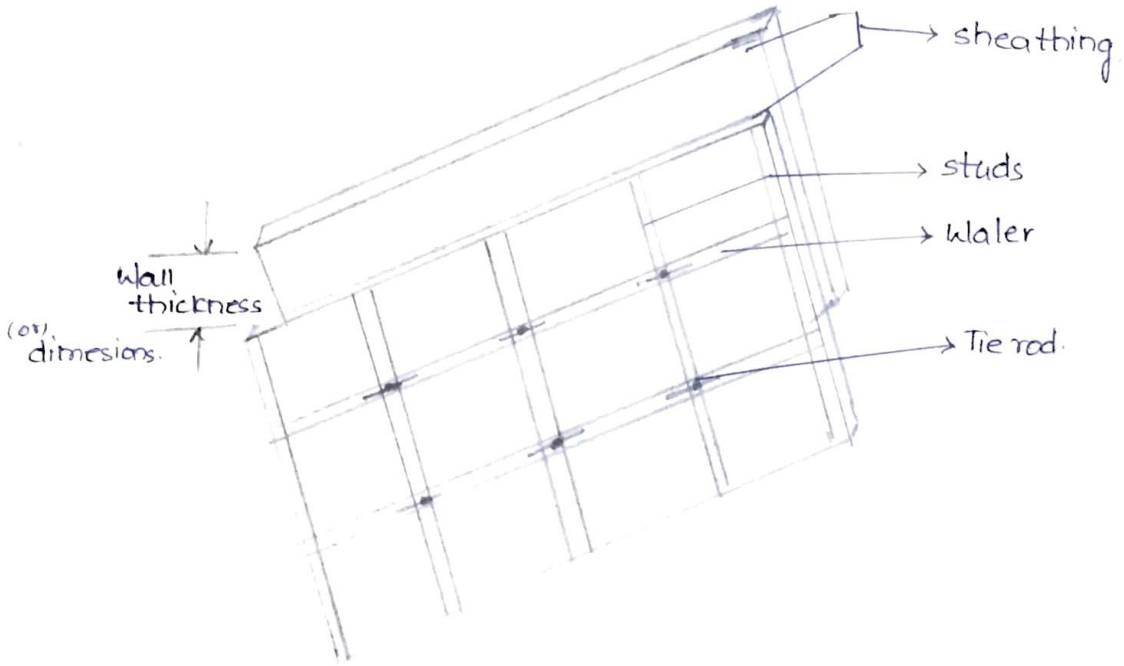
Walers are provided normal to the studs to support them.

Step-5

Design of tie rods

Later tie rods are calculated. Tie rods are the connectio

given to tie studs and walers.



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I	II	MID TERM EXAMINATION

No. 159169

H.T. No.	2	1	2	4	1	D	2	0	2	1

Name of the Examination I M.Tech II Semester Mid I

Course STE Branch Civil Date 19/08/2022

Signature of the Invigilator

Q.NO.	1		2		3		4		5		6		TOTAL
	a	b	a	b	a	b	a	b	a	b	a	b	
MARKS			2		2				2				6/15

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2) Selection of formwork :-

The selection of formwork is governed by the following factors. The factors are baced on quantitative and quality. The quantitative factors like cost and time period. The quality factors like flexibility, quality. and safety.

The important parameter that effecting the selection of formwork. Classfied as

a) The type of building elements to be formed.

b) the type of sheathing material.

c) Safety and serviceability.

d) economics.

The factors that effecting selection of formwork :-

1) Building Designs

The building designed Proposed for a Project can have a major influence on the selection of form work system.

The floor to floor hight.

2) Job Specification :- The required selection of material like timber, wood based on Selection of the root for the smooth finishing

3) local Conductions :- Based on the weather Conductions the type of metal will be used for the formwork. In the cool Climate Condition Concrete takes time for hardning.

4) Supporting management :- Providing the required material for the Construction by the management is also include the selection of formwork.

The management failes to Provide the required material on time.

5) foundation wall formwork design:-

i) The Vertical formwork construction is usually called wall formwork. The vertical wall formwork are sheating, Sheatering, wales, tie rods, and alignment Props.

ii) for the Construction of staring the plywood sheets are used 12 mm and 24mm. the size of the thickness may varyes.

iii) The mostly Comonly used thickness is 9mm to 12 mm.

iv) The gaps are Provided to acudmate the tie rods. The tie rods are metal rods. they resist the tenzile forces.

v) depending upon maximum pressure applying on the wall formwork. The spacind and strip are Provided

vi) The shores will be at least two are one side bottom in the formwork Construction.

vii) To Voide the gabes and maintain the equal distance between them the metal rods are Provide with liting bolts at the corner of the Plywood sheets.

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Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

I M. Tech II Semester MID II EXAMINATION Aug 2022

Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of Exam 17-08-22** **Max.Marks: 5 Marks**

Name : D. Prashanth **Roll No.** 21241D2001

1. The _____ is used for formwork when it is desired to reuse the formwork several times. [b]
   a) Stone b) Steel c) Timber d) Bamboo
2. _____ gives excellent exposed concrete surface requiring no further finishing treatment. [c]
   a) Timber b) Teak wood c) Steel d) Fibre glass
3. When form work is required for small ones requiring less repetitions, the _____ is preferred to Steel. [b]
   a) Steel b) Timber c) Fibre glass d) Metal sheets

4. The _____ formwork should be neither too dry nor too wet. [c]
   a) Fibre glass b) Steel c) Timber d) Metal

5. It is found that moisture content of about _____ is appropriate for the timber formwork. [a]
   a) 20% b) 30% c)40% d)50%
6. The _____ formwork can be reused several time as compared to ordinary Timber formwork. [b]
   a) Sunmica b) Plywood c) Fibre ply d) Cardboard
7. The column formwork consists of a box prepared from _____ separate sides. [d]
   a) One b) Two c) Three d) Four

8. The formwork for an _____ consists of rows of the vertical post which carry small wooden beams at their tops [b]
   a) RCC floors b) RCC slab c) RCC column d) RCC beam

9. In case of formwork for the floor, the _____ supports should be firmly supported at the bottom [b]
   a) Horizontal b) Vertical c) Inclined d)Slanting
10. The formwork for _____ consists of stringers, sheets, joist, bearers and vertical post. [d]
    a) Walls b) Column c) Beams d) Stairs

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Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering
I M. Tech II Semester MID II EXAMINATION Aug 2022
Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of Exam 17-08-22** **Max.Marks: 5 Marks**

Name : Bandi Sri Ram Gopal **Roll No.** 21241D2002

1. The _____ is used for formwork when it is desired to reuse the formwork several times. [C]
   a) Stone b) Steel c) Timber d) Bamboo
2. _____ gives excellent exposed concrete surface requiring no further finishing treatment. [C]
   a) Timber b) Teak wood c) Steel d) Fibre glass
3. When form work is required for small ones requiring less repetitions, the _____ is preferred to Steel. [b]
   a) Steel b) Timber c) Fibre glass d) Metal sheets

4. The _____ formwork should be neither too dry nor too wet. [a]
   a) Fibre glass b) Steel c) Timber d) Metal

5. It is found that moisture content of about _____ is appropriate for the timber formwork. [a]
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6. The _____ formwork can be reused several time as compared to ordinary Timber formwork. [a]
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7. The column formwork consists of a box prepared from _____ separate sides. [b]
   a) One b) Two c) Three d) Four

8. The formwork for an _____ consists of rows of the vertical post which carry small wooden beams at their tops [C]
   a) RCC floors b) RCC slab c) RCC column d) RCC beam

9. In case of formwork for the floor, the _____ supports should be firmly supported at the bottom [b]
   a) Horizontal b) Vertical c) Inclined d)Slanting
10. The formwork for _____ consists of stringers, sheets, joist, bearers and vertical post. [b]
   a) Walls b) Column c) Beams d) Stairs

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering
I M. Tech II Semester MID II EXAMINATION Aug 2022
Design of Formwork (GR20D5015)

Time: 15 Minutes **Date of Exam 17-08-22** **Max.Marks: 5 Marks**

Name : C Madhavi **Roll No.** 21241D2003

1. The _____ is used for formwork when it is desired to reuse the formwork several times. [c]
   a) Stone b) Steel c) Timber d) Bamboo
2. _____ gives excellent exposed concrete surface requiring no further finishing treatment. [b]
   a) Timber b) Teak wood c) Steel d) Fibre glass
3. When form work is required for small ones requiring less repetitions, the _____ is preferred to Steel. [d]
   a) Steel b) Timber c) Fibre glass d) Metal sheets
4. The _____ formwork should be neither too dry nor too wet. [d]
   a) Fibre glass b) Steel c) Timber d) Metal
5. It is found that moisture content of about _____ is appropriate for the timber formwork. [a]
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10. The formwork for _____ consists of stringers, sheets, joist, bearers and vertical post. [a]
    a) Walls b) Column c) Beams d) Stairs

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K. Lathasree.

I	II

MID TERM EXAMINATION

No. 159161

H.T. No.	2	1	2	4	1	D	2	0	0	6

Name of the Examination M.Tech 1st year, IInd sem, II mid

Course Design of formwork Branch Civil - STE Date 17/08/2022

17/8/22

Signature of the Invigilator

Q.NO.	1		2		3		4		5		6		TOTAL
	a	b	a	b	a	b	a	b	a	b	a	b	
MARKS	5				4						4		13/15

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6 Ans:- Various formwork Issues in Multi story Building Construction :-

The formwork issues in multi story Building construction are :-

1) The formwork Details should be clear and detailed
2) formwork materials should be properly investigate
3) Estimation of formwork cost.
4) Improper stripping and Removal of shoring.

The stripping of formwork is to be good enough to the structures. for casting of any member the stripping is the main one to have to stripping the formwork with good enough. Removal of shoring is the basic one which have to build the formwork. The shores have to be placed at the ground level to the structure of a building. If proper shoring is take place then the structure is safe in formwork and ready to cast shores are the one which is aligned parallel to the wall and it acts as a supporting structure to the structure.

5) Improper lateral bracing

If the lateral bracing is not so good enough and it is very tough to build the formwork. Lateral bracings gives support to the shoring

6) Vibration of concrete techniques :-

The vibration of concrete is done to very slowly rather than fast. If The vibration of concrete also have

the techniques. If improper vibration is done it leads to Honeycombs etc. Vibration of concrete should be done very careful then it will effect the formwork failure.

7) Soils present in mud level soil :-

If the soil below the ground is strong then formwork will be strong if wind is blown. If the soil below the mud soil is weaker then formwork is very tough to stand.

8) Concrete placing Techniques :-

Concrete placing Techniques also one of the method in the design of formwork. At edges and corners the placing of Concrete is not to be done. If it applied directly then results caused to great damage.

3 Ans:- Different Steps involved in flying formwork cycle and mention their limitations

1) Flyformwork is very huge formwork which is easy to

Cast huge rise buildings such as Hospitals, High rise Building, Bridges, Tunnels etc.

2) The flying formwork can be reused several times it can be used for floor to floor height the formwork is raised up with the help of cranes

3) flying formwork can be classified into i) Tunnel formwork, ii) Table formwork iii) Slip formwork

4) After the casting of one floor it can easily to be used for another floor.

5) The construction of this type of formwork is completed very fast and completion of work is completed with in time

6) The Tunnel formwork can be used for casting of wall and slab for this type of construction the Tunnel formwork is used.

7) Tunnel formwork will be used very quickly to complete the construction of half of a building.

8) The Table formwork is used to cast the same Horizontal alignment of a building.

9) The casting of Table formwork is very helpful for casting of Horizontal members with same dimensions and alignment

10) The Slip formwork is the one type of flying formwork in slip formwork the Horizontal, vertical and inclined members is to be casted at a time. The usage of slip formwork is used for High raised structure.

11) The reusage of flying formwork is very fast and speed.

12) Usage of flying formwork is very much usage Now-a-days for fast completion of work.

Limitations of flying formwork

1) Flying formwork will be used for High raised structures only.

2) The construction of the structure is open facade (face)

ribs etc are the materials.

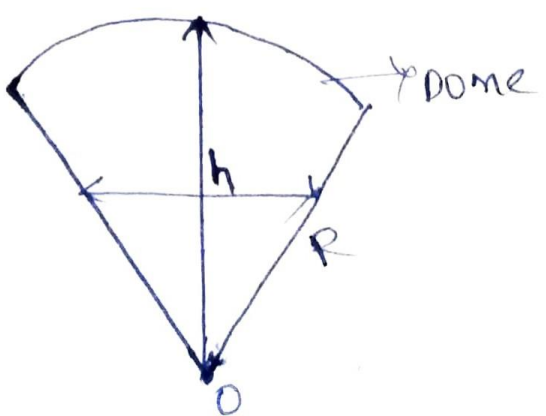
4) The basic issue on construction of Dome roof is the alignment of a structure.

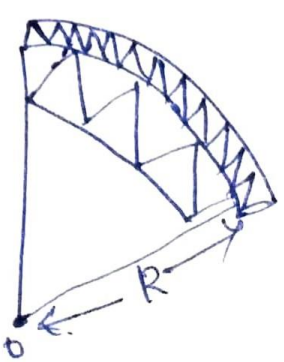
5) first the formwork is placed one after the another. with the help of lateral ties first the sides of the walls is constructed then after placing of circular, semicircular shapes of Domes is to be select

6) Dome roofs are seen in College Building, Hospital & other Architecture work like structures

7) The importance of Dome roof formwork is a good look and the good Architecture

8) By placing the Dome roof formwork it should be placed very carefully in placing it should check for how many lateral ties are required for construction of Dome roof





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I	II ✓	MID TERM EXAMINATION

No. 459126

H.T. No.	2	1	2	4	1	D	2	0	0	1

Name of the Examination M.Tech I Year II-Sem Mid-II

Course M.Tech. Branch STE Date 17/08/22

Signature of the Invigilator

Q.NO.	1		2		3		4		5		6		TOTAL
	a	b	a	b	a	b	a	b	a	b	a	b	
MARKS	4								4				8/15

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(5)

There are various reasons for the failure of the formwork. which leads to the huge loss. Some of the failures are

1) Improper Stripping:-

If Stripping of formwork is done at stage of Premature of concrete. It leads to cracking (or) even collapse of the structure, because the at this stage concrete has not gained enough Strength to support itself.

again and again with much ease. and there is no need to dismantle the formwork.

Table:-

This is a flat table with a adequate supports at bottom. It is mostly used for the flat slabs. This can be carried and placed easily. In this type walls are not casted along with slab

column mounted Shoring:-

In this type the entire ~~rear~~ formwork is supported by the constructed column. and there is no intermediate supports.. so only the column carry the entire loads. This can used only in the special cases, where there is no place for the vertical supports.

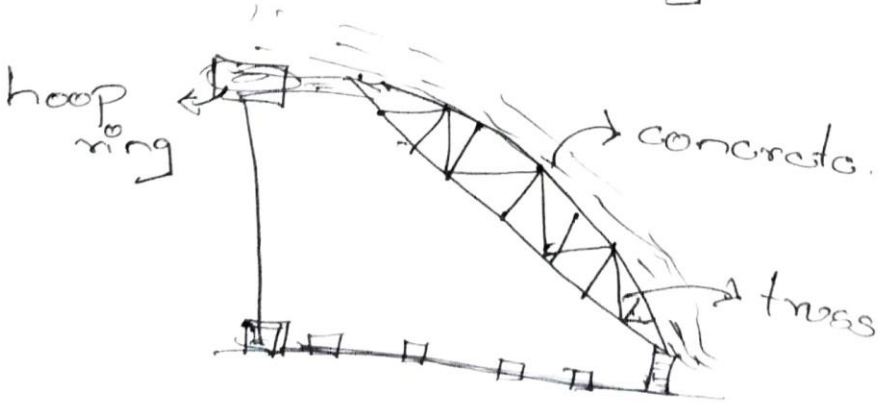
(1)

Dome Roof:-

The formwork used for it is a special type formwork. As the surface is curved which is very complex to design. There are lot of parameters to be considered, to avoid the failure of Dome roof. It requires skilled labour.

Reactors are a special structure so there should no even single crack, the formwork plays a major role in the result.

The formwork used is mostly truss type and it consist of a hoop ring to adjust the formwork



DfW
Assignment I & II

5/5

Ch. Sandhya
212411D2012

1. Explain briefly about various reasons for formwork failure and mention atleast five case studies in formwork failure.

Collapse of the formwork can cause loss of life and serious injuries to crew members, supervisors, and even to third parties. This may also cause property damage, construction delays, and loss of morale of the crew members. some leading causes of formwork failures are discussed in the following sections:

1. Improper stripping and shore removal: premature stripping of forms, premature removal of shores, and careless practices in restoring can produce catastrophic results. The collapse of floors result into impact loading of the floor directly below it which also fail and collapse to the lower floor. This has a domino effect and by the impact load from the weight of upper floor debris, lower floors also collapsed subsequently all in a span of less than an hour.
2. Inadequate lateral bracing: The more frequent causes of formwork failure are other effects that induce lateral force components or induce displacement of the supporting members. Inadequate cross bracing and horizontal bracing of shores is one of the factors most frequently involved in formwork accidents. When a failure occurs in one part, inadequate bracing may permit the collapse to extend a large portion of the structure and multiply the damage.
3. Vibration due to concrete placing equipment: forms sometimes collapse when their supporting shores or sacks are displaced by the vibration caused by passing traffic, the movement of the workers and the equipment on the formwork and the effect of vibrating concrete to consolidate it.

4. Unstable soils under mudsills: Unstable soils under the mudsills can also cause the formwork to fail the mudsills act as a base for a shore or post in formwork. formwork should be safe if it is adequately braced and constructed. So all loads are carried to the solid ground through vertical members.

5. Concrete placing equipment: The temperature and the rate of vertical placement of concrete are the factors influencing the development of lateral pressure that acts on the forms. If the temperature drops during construction operations, rate of concreting often has to slowed down to prevent the building of lateral pressure overloading the forms. If this is not done formwork failure may happen

6. Lack of attention of formwork Details: Even when the basic formwork design is soundly conceived, small differences in assembly details may cause local weakness or overstress leading to form failure. This may be as simple as insufficient nailing or failure to tighten the locking devices on metal shoring.

2) Write short note on Table formwork, Tunnel formwork, slip formwork.

i) Table formwork: Is another variant of flying form. The table form is also equally capable of providing very high speed of construction. The system is primarily used for multi-storey building such as residential flats, hotels, hostels, offices and commercial buildings. Construction works with regular plan layouts and long repetitive structures. The table form is a large pre-assembled formwork. It consists of a formdeck of fairly large area up to about 100m². The commonly used sheathing material is plywood, although steel sheathing is also used.

Tunnel form is a formwork system through which it is possible to cast the walls and slabs in one operation on a daily cycle. The tunnel formwork is used to form repetitive cellular structures such as hostels, residential building hostels etc. It is possible to achieve speed without compromising on the quality. The tunnel formwork uses steel for all the components. The formwork system consists of the sheathing of a thick steel plate both for casting the wall and ceiling, waler, and the diagonal strut assembly.

iii) slip form

* slip formwork construction, also known as sliding form construction, is similar to extrusion process in which the wet concrete is extruded rather than retained in the forms until it has hardened.
* In this method, the concrete is placed at pre-determined rate on top of a travelling form, which emerges in a hardened state from the bottom.
* In slip form, the forms moves semi continuously with respect to the concrete surface.

3) Discuss the different steps involved in formwork management in post award stage. List out various responsibilities of formwork engineer located at site.

post-award formwork management:

1. preparation of schedule of formwork activities: On award of the Contract, the contractor modifies the project schedule to take into consideration only changes that might have taken place between the schedule submitted at the time of tendering and the award of contract.
2. Detailed planning: Cost of the formwork is high. so the formwork material is correctly estimated and the materials are procured accordingly.

DfW

Assignment - I & II

5/5

P. Divya (1)
21211d2004

3. preparation of formwork scheme :- The formwork scheme, corres
- to various typical formwork activities is prepared.

4. Effective utilisation of formwork materials :- During the execution of formwork, engineers should take interest and give guidance in planning the arrangement and correcting the abuse/misuse of materials.

5. Monitoring of formwork cost :- It is absolutely essential that like other activities, the cost of formwork activities is also monitored regularly

DfW

Assignment - I & II

5/5

P. Divya (1)
21241d2004
M. Tech 1st year
2nd sem

1) Explain briefly about various reasons for formwork failure and mention atleast five case studies in formwork failure

A) Collapse of the formwork can cause loss of life and ~~section~~ Serious injuries to crew members, supervisors, and even to third parties. This may also cause property damage, construction delays, and loss of morale of the crew members. Some leading causes of formwork failures are discussed in the following sections:-

1) Improper stripping and shore removal :- Premature stripping of forms, premature removal of shores, and careless practices in reshoring can procedure catastrophic results. The collapse of floors results into impact loading of the floor direct below it which also fail and collapse to the lower floor. This has a domino effect and by the impact load from the weight of upper floor to bris, lower floors also collapsed subsequently all in a span of less than an hour.

2) Inadequate Lateral Bracing :- The more frequent causes of formwork failure are other effects that induce lateral force components or induce displacement of the supporting members. Inadequate cross bracing and horizontal bracing of shores is one of the factors most frequently involved in formwork accidents. When a failure occurs in one part, inadequate bracing may permit the collapse to extend to a large portion of the structure and multiply the damage.

3) Vibration Due to concrete placing Equipment :- Forms sometimes collapse when their supporting shores or jacks are displaced by the vibration caused by passing traffic, the movement of the workers and the equipment on the formwork, and the effect of vibrating concrete to consolidate it.

4) Unstable soils under Mudsills :- Unstable soils under the mudsills can also cause the formwork to fail. The mudsills act as a base for a shore or post in formwork. Formwork should be safe if it is adequately braced and constructed

so all loads are carried to the solid ground through vertical members

5) concrete placing techniques :- The temperature and the rate of vertical placement of concrete are the factors influencing the development of lateral pressure that acts on the forms. If the temperature drops during construction operations, rate of concreting often has to be slowed down to prevent the build-up of lateral pressure as overloading the forms. If this is not done, formwork failure may happen.

6) Lack of Attention to formwork details :- Even when the basic formwork design is soundly conceived, small differences in assembly details may cause local weakness or overstress leading to form failure. This may be as simple as insufficient nailing, or failure to tighten the locking devices on metal shoring.

2) write short note on 1) table formwork 2) tunnel formwork 3) slip form work.

A) (i) table forms :- is another variant of flying form. The table form is also equally capable of providing very high speed of construction. The system is primarily used for multi-storey building (such as residential flats, hotels, hostels, offices and commercial buildings) construction works with regular plan layouts and less repetitive structures. The table form is a large pre-assembled formwork. It consists of a form deck of fairly large area up to about 100 m^2. The commonly used sheathing material is plywood, although steel sheeting is also used.

(ii) Tunnel form :- is a formwork system through which it is possible to cast the walls and slabs in one operation on a daily cycle. The tunnel formwork is used to form repetitive cellular structures such as hotels, residential building hostels etc., It is possible to achieve speed without compromising on the quality. The tunnel formwork uses steel for all the components. The formwork system consists of the sheathing of a thick steel plate both for casting the

wall and ceiling, waler, and the diagonal stayed assembly.

3) Slip form:-

* slip form construction, also known as sliding form construction, is similar to extrusion process in which the wet concrete is extruded rather than retained in the forms until it has hardened.

* In this method, the concrete is placed at a pre-determined rate on top of a travelling form, which emerges in a hardened state from the bottom.

* In slip form, the form moves semi continuously with respect to the concrete surface.

5) Discuss the different steps involved in formwork management in post award stage. List out various responsibilities of formwork engineer located at site.

A) Post-awarded Formwork management :

(1) Preparation of schedule of formwork activities :- On award of the contract, the contractor modifies the project schedule to take into consideration any changes that might have taken place between the schedule submitted at the time of tendering and the award of contract.

(2) Detailed planning :- cost of the formwork is high, so the formwork material is correctly estimated and the materials are procured accordingly

(3) Preparation of formwork scheme :- the formwork scheme, corresponding to various typical formwork activities is prepared,

(4) Effective utilization of formwork materials :- During the execution of formwork, engineers should take interest and give guidance in planning the arrangement and correcting the abuse / misuse of materials.

(5) monitoring of formwork cost :- It is absolutely essential that like other activities, the cost of formwork activities is also monitored regularly.

CODE:GR20D5015 | GR 20 | SET - 1

M.Tech I Year II Semester Regular Examinations, September 2022

DESIGN OF FORMWORK
(Structural Engineering)

Time: 3 hours **Max Marks: 70**

Instructions:

1. Question paper comprises of **Part-A** and **Part-B**
2. **Part-A** (for 20 marks) must be answered at one place in the answer book.
3. **Part-B** (for 50 marks) consists of **five questions with internal choice,** answer all questions.

PART – A
(Answer ALL questions. All questions carry equal marks)

10 * 2 = 20 Marks

1. a.	List form work materials.	CO1, BL1	[2]
b.	Outline types of 4 major requirements of formwork.	CO1, BL2	[2]
c.	Outline types of 2 design concepts of formwork.	CO2, BL2	[2]
d.	Mention the requirement for Formwork Systems.	CO2, BL1	[2]
e.	Elucidate the design steps involved in design of formwork for domes.	CO3, BL2	[2]
f.	Summarize different types of traditional formwork.	CO3, BL2	[2]
g.	What is mean by flying formwork?	CO4, BL1	[2]
h.	What are the materials used in Slip Form?	CO4, BL1	[2]
i.	Give the reasons for formwork failure.	CO5, BL2	[2]
j.	Mention any two recent case studies in formwork failure.	CO5	[2]

PART – B
(Answer ALL questions. All questions carry equal marks)

5 * 10 = 50 Marks

2.	(a) Write notes on following material (i) Aluminium (ii) plastic	CO1, BL2	[10]
	(b) Write short note on Form work selection.	CO1, BL2	
	OR		
3.	(a) Write notes on following material (i) Plywood, (ii) Steel	CO1, BL2	[10]
	(b) What are the Requirements in Selection of Formwork?	CO1, BL1	
4.	(a) Explain the steps for design of formwork for Foundations.	CO2, BL3	[10]
	(b) Explain the steps for design of formwork for Beams.	CO2, BL3	
	OR		

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5.	(a) Explain the steps for design of formwork for Walls.	CO2, BL3	[10]
	(b) Explain the steps for design of formwork for slab.	CO2, BL3	
6.	(a) Outline types of shells and folded plates.	CO3, BL2	[10]
	(b) Explain the design procedure of formwork for shells.	CO3, BL3	

OR

7.	(a) Analyze briefly about Natural Draft Cooling Tower.	CO3, BL4	[10]
	(b) Analyze the design procedure of formwork for Overhead Water Tanks.	CO3, BL4	
8.	(a) Outline in detail about table form.	CO4, BL3	[10]
	(b) Describe the procedure to construct tunnel form.	CO4, BL2	

OR

9.	(a) Explain in detail about Formwork for Precast Concrete.	CO4, BL3	[10]
	(b) Explain Formwork Management Issues.	CO4, BL3	
10.	(a) Explain the Case studies in Formwork Failure.	CO5, BL3	[10]
	(b) Describe how to avoid failures in formwork.	CO5, BL3	

OR

11.	(a) Explain the reasons for formwork failure.	CO5, BL2	[10]
	(b) Describe Form work Issues in Multi Story Building Construction.	CO5, BL2	

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Gokaraju Rangaraju Institute of Engineering and Technology

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Summary Sheet CO Attainments

Academic Year:	2021-22	Name of the Program:	M.Tech Structural
Course/Subject:	Design of Formwork	Course Code:	GR20D5015
Department:	Civil Engineering	Year - Semester :	I Yr- II Sem
Section	A		

Attainment/CO	CO1	CO2	CO3	CO4	CO5
Attainment for Direct Internal CO (Mid I & II, Assignments, Tutorials, Assessments, etc.)	3.00	3.00	3.00	2.15	3.00
Attainment for Direct External CO (End Semester Exam)	3.00	3.00	3.00	3.00	3.00
Direct CO (0.3*Internal + 0.7*External)	3.00	3.00	3.00	2.75	3.00
Indirect CO	3.00	3.00	3.00	3.00	3.00
Final CO (COFn) = (0.9 x Direct CO + 0.1 x Indirect CO)	**3.00**	**3.00**	**3.00**	**2.77**	**3.00**

CO	Course Outcome	Remedial Action for COs Less than 70% (2.10)
CO1	Understand the necessity and types of form work for various structures of civil	-
CO2	Design the form work for various structural elements like beam, slab, column, wall and	-
CO3	Design the form work for special structures like shells, retaining walls, bridges, Sylos,	-
CO4	Understand the working of flying form work like tunnel forms, slip forms and table	-
CO5	Judge the form work failures from case studies	-

ID No.	Name of the Faculty	Department	Signature
1177	Mrs K Hemalatha	Civil Engineering	

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Direct Internal CO Attainments

Academic Year	2021-22	Department	Civil Engineering	Name of the Programme	M.Tech Struct
Year - Semester	I Yr- II Sem	Course Name :	Design of Formwork	Course Code	GR20D5015

P-Outcomes / C-Outcomes	1	2	3	4	5	6
1	M		H	M	M	M
2	M	M	H	M		
3	M	H	M	H		M
4		H	H		M	
5		M		M	M	

Enter H,M, L values of CO-PO Mapping Matrix in blue shaded rows 12 - 18 for seven CO s automatically PO Attainments are Calculated ←

Convert above mappings to scale 1-3

P-Outcomes / C-Outcomes	1	2	3	4	5	6
CO1	2		3	2	2	2
CO2	2	2	3	2		
CO3	2	3	2	3		2
CO4		3	3		2	
CO5		2		2	2	
Expected Attainment	2.00	2.50	2.75	2.25	2.00	2.00

Fill the below table with obtained attainments in mids, external and Tutorial/Attendence

	CO1	CO2	CO3	CO4	CO5
Final Cos CoF	3.00	3.00	3.00	2.77	3.00

	Attained PO A	Attained PO B	Attained PO C	Attained PO D	Attained PO E	Attained PO F
CO1	2.00		3.00	2.00	2.00	2.00
CO2	2.00	2.00	3.00	2.00		
CO3	2.00	3.00	2.00	3.00		2.00
CO4		2.77	2.77		1.85	
CO5		2.00		2.00	2.00	
Attained	2.00	2.44	2.69	2.25	1.95	2.00

Note : If Average Attainment of a PO is #Div/0! Relace the corresponding PO with blank.

	A	B	C	D	E	F
	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6
Expected	2.00	2.50	2.75	2.25	2.00	2.00
Attained	2.00	2.44	2.69	2.25	1.95	2.00
	100.00	97.71	97.92	100.00	97.45	100.00

Note : PO is Satisfied if attained PO > 70, U indicates PO Unsatisfied