GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

Department of Civil Engineering

COURSE FILE

Course Name: FM & HM LAB

Course Code: GR20A2022

II B.Tech – 2nd Semester

Academic Year: 2021-22

S.Venkata Charyulu Asst.Professor/ Mr.R Rathod Asst.prof

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

Strength of Materials Laboratory

Course File Check List

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GOKARAJU RANGARAJU INSTITUTE OF ENGINEERING AND TECHNOLOGY

FLUID MECHANICS AND HYDRAULIC MACHINERY LAB

Course Code: GR18A2022 L/T/P/C: 0/0/2/1

II Year II Semester

Course Objectives: The objectives of this course is to make the student to

- Demonstration of the discharge through venturi meter and orifice meter.
- Verify the Energy head in the pipe flows and able to compute impact coefficients of jet.
- Describe the laminar and turbulent flows and velocity distribution in pipe lines.
- Evaluate the major and minor losses in pipe flow.
- Compute the efficiency of Pelton wheel turbine and multistage centrifugal pump.

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

- Predict the discharge through Venturi meter and orifice meter.
- Estimate the energy heads.
- Compute the Reynolds number for types of flows.
- Compute the losses in pipe flow.
- Evaluate the efficiency of hydraulic machines.

Task-1: Verification of Bernoulli's Theorem

Task-2: Calibration of Venturi meter.

Task-3: Calibration of Orifice meter.

Task-4: Impacts of jets on vanes.

Task-5: Reynolds experiment Laminar Flow through pipes.

Task-6: Reynolds experiment Turbulent flow through pipes.

Task-7: Multi stage centrifugal pump.

Task-8: Major losses in pipe flow.

Task-9: Minor losses in pipe (Hydraulic losses due to sudden enlargement of pipe).

Task-10: Minor losses in pipe (Hydraulic losses due to sudden contraction of pipe).

Task-11: Pelton wheel turbine.

Task-12: Hydraulic Jump.

Task-13: Calibration of Rectangular notch.

Task-14: Calibration of Triangular notch.

GOKARAJU RANGARAJU
INSTITUTE OF ENGINEERING AND TECHNOLOGY
Department Of Civil Engineering

Subject Code	Subject Name	Faculty Code	
GR20A2022	FM & HM LAB	SVC/IC/RR	

Day/Time	08:50-09:40	09:40-10:30	10:30-11:20	11:20-12:00	12:00-12:55	12:55-01:50	01:50-02:45
Monday				Lunch Break			
TUESDAY					FM & HM LAB	FM & HM LAB	FM & HM LAB
Wednesday	FM & HM LAB	FM & HM LAB	FM & HM LAB				
Thursday							
FRIDAY							
Saturday							

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Program Educational Objectives (PEOs)

PEO1: Graduates of the program will be successful in technical and professional career of varied sectors of Civil Engineering.

PEO2: Graduates of the program will have proficiency to analyze and design real time Civil Engineering projects.

PEO3: Graduates of the program will exhibit management and leadership qualities with good communication skills facilitating to work in a multidisciplinary team.

PEO4: Graduates of the program will continue to engage in life-long learning with ethical and social responsibility.

Program Outcomes (PO's)

Graduates of the Civil Engineering program will be able to

PO1: Apply knowledge of mathematics, science and fundamentals of Civil Engineering.
PO2: Analyse problems and interpret the data.
PO3: Design a system component, or process to meet desired needs in Civil Engineering within realistic constraints
PO4: Identify, formulate, analyse and interpret data to solve Civil Engineering problems.
PO5: Use modern engineering tools such as CAD and GIS for the Civil Engineering practice.
PO6: Understand the impact of engineering solutions in a global, economic and societal context.
PO7: Understand the effect of Civil Engineering solutions on environment and to demonstrate the need for sustainable development.
PO8: Understand the professional and ethical responsibility.
PO9: Work effectively as an individual or in a team and function with multi-disciplinary context.
PO10: Communicate effectively with engineering community and society.
PO11: Demonstrate the management principles in Civil Engineering projects.
PO12: Recognize the need for and an ability to engage in life-long learning.

Program Specific Outcomes (PSO's)

PSO1: Recognize the need for a sustainable environment and design smart infrastructure considering the global challenges.

PSO2: Create and develop innovative designs with new era materials through research and development.

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COURSE OBJECTIVES

Academic Year : 2021 -2022
Semester : II

Name of the Program : B.Tech **Year:** II Year **Section:** A

Course/Subject FM And HM Lab **Course Code** : **GR20A2022** **Name of the Faculty** : S Venkat charyulu / Mr Rathod

D**esignation:** Professor /Assistant Professor **Dept.:** Civil Engineering

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

S.No	Objectives
1	Demonstration of the discharge through venturi meter and orifice meter.
2	Verify the Energy head in the pipe flows and able to compute impact coefficients of jet.
3	Describe the laminar and turbulent flows and velocity distribution in pipe lines.
4	Evaluate the major and minor losses in pipe flow
5	Compute the efficiency of Pelton wheel turbine and multistage centrifugal pump.

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

S.No	Course Outcomes
1	• Predict the discharge through Venturi meter and orifice meter.
2	Predict the major and Minor losses in pipes verifying the Energy equation
3	• Estimate the energy heads
4	Compute the Reynolds number for types of flows.
5	. Compute the losses in pipe flow.
5	• Evaluate the efficiency of hydraulic machines

: Signature of HOD Signature of faculty

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Department of Civil Engineering

STUDENTS ROLL LIST (2021-22)- Section A

S.No.	Roll No.	Student Name
1	20241A0101	AADHI SRIKAR RAO
2	20241A0102	ABHIRAM SAI YADAV JANGITI
3	20241A0103	BACCHUGUDAM RITHVIK REDDY
4	20241A0104	BANDLA NAVEEN
5	20241A0105	B.PRANAV SAI
6	20241A0106	BHATTU SUPREETH CHAKRAVARTHY
7	20241A0107	BHUPATHIRAJU HIMANTHAVARMA
8	20241A0108	BOINI HEMANTH
9	20241A0109	CHALLA AJAY KUMAR
10	20241A0110	DONABOINA SRI HARI
11	20241A0111	EPPA ARNAV
12	20241A0112	G L N RAGHURAMAN
13	20241A0113	GANDLA HARSHITH KUMAR
14	20241A0114	GUGGILLA SHASHANK
15	20241A0115	GUNDA SRIKANTH
16	20241A0116	JANGILI SRAVAN KUMAR
17	20241A0117	JANJIRALA SRUTHI

18	20241A0118	JARAPULA JAYANTH
19	20241A0119	K NIKHITHA
20	20241A0120	K SANJEEV KUMAR
21	20241A0121	K.KONDAL
22	20241A0122	KAMMAMPATI UDAYKIRAN
23	20241A0123	KARNE SRITHAN
24	20241A0124	KUNCHALA VARUN KUMAR
25	20241A0125	KUNTA NITHIN REDDY
26	20241A0126	M PAVAN KALYAN
27	20241A0127	MERE MAHESH
28	20241A0128	MOHAMMED AHMED
29	20241A0129	MOTHUKURI LAXMAN
30	20241A0130	MOTTADI ADITYA TEJA
31	20241A0131	MULA SUSHMA SRI
32	20241A0132	NAYINI SWETHA
33	20241A0133	PAIDIPALLY BHARATH
34	20241A0134	P.SAI KIRAN REDDY
35	20241A0135	PASNOOR PAVAN PRATHAP REDDY
36	20241A0136	PATHLAVATH SHIVA NAYAK
37	20241A0137	PEDDIBOINA ANUSHA
38	20241A0138	POREDDY ABHINAV REDDY
39	20241A0139	PULLAGURA SANTHOSH
40	20241A0140	RACHALA BHARATH
41	20241A0141	RADHARAPU SHAJI KUMAR
42	20241A0142	RAMAVATH ROJA
43	20241A0143	RATHLAVATH SAIRAM NAYAK
44	20241A0144	RAVI TEJA PASUNUTHI
45	20241A0146	SADDI SHRIANK REDDY
46	20241A0147	SATHVIKA NARLA
47	20241A0148	SOKKULA KOUSHIKREDDY

48	20241A0149	SRIRAM PANDAVULA
49	20241A0150	T.BHARGAVI
50	20241A0151	T.BHUVANESHWARI
51	20241A0152	S.TEJA RETIESH REDDY
52	20241A0153	TEJAVATH KALYANI
53	20241A0154	TELLAPURAM PRUDHVI RAJ
54	20241A0155	THADEM ROHITH
55	20241A0156	THUMMALA RAJASHEKAR
56	20241A0157	UVSGR KAMESWARA SAI KARTHIK
57	20241A0158	SREERAM VATTEM
58	20241A0159	V VIKESH
59	20241A0160	VENNAM SRIKAR
60	21245A0101	GUMADAVELLI ARUN KUMAR
61	21245A0102	KADIRABAD SRIRAM
62	21245A0103	MANIKONDA NIKITHA
63	21245A0104	PARIDULA PRATHYUSHA
64	21245A0105	PATERU MOUNA

Gokaraju Rangaraju Institute of Engineering and Technology

Department of Civil Engineering

GUIDELINES TO STUDY THE COURSE SUBJECT

Academic Year : 2021 -2022

Semester : II

Name of the Program : B.Tech **Year:** II Year **Section:** A

Course/Subject : s venakt charyulu/ Mr. Rathod

D**esignation:** Professor /Assistant Professor **Dept.:** Civil Engineering

Guide line to study the course/subject: Fm and HM Lab

The course helps the students to study various methods of calculating the Fluid properties and pipe flows, such as Discharges, coefficients. The methods employed to predict the response of a coefficients and pipe flow losses . They can also able analyse the energy verifications and important Pipe net working designs. Various fluid machines demonstrated for the hydraulic efficiencies calculations .

Students should have the following prerequisites

1. Fundamentals of Engineering mathematics
2. Knowledge of Engineering Hydraulic Mechanics
3. Knowledge of Basics of Fluid mechanics
4. Knowledge on different Manometers
5. Different types channel flows

Where will this subject help? : Apllication of Pipe network designing, constructing minor Irrigation structures, flow energy conrling in the channel flows, and can hlp ful to understand hydraulic mechines calculations.

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FM & HM LAB

Course Code: GR20A2022 **L:0 T:0 P:2 C:2**

II Year. II Semester

Contents

Task-1: Verification of Bernoulli's Theorem

Task-2: Calibration of Venturi meter.

Task-3: Calibration of Orifice meter.

Task-4: Impacts of jets on vanes.

Task-5: Reynolds experiment Laminar Flow through pipes.

Task-6: Reynolds experiment Turbulent flow through pipes.

Task-7: Multi stage centrifugal pump.

Task-8: Major losses in pipe flow.

Task-9: Minor losses in pipe (Hydraulic losses due to sudden enlargement of pipe).

Task-10: Minor losses in pipe (Hydraulic losses due to sudden contraction of pipe).

Task-11: Pelton wheel turbine.

Task-12: Hydraulic Jump.

Task-13: Calibration of Rectangular notch.

Task-14: Calibration of Triangular notch.

SCHEDULE OF INSTRUCTIONS
SESSION PLAN

Academic **Y**ear : 2021-2022

Semester : II / II

Name of the Program: B. Tech Year: II Section: A BATCH A1

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering

Designation: ASST.PROFESSOR

Lesson No.	**Date**	**No. of Periods**	**Topics / Sub-Topics**	**Objectives & Outcomes Nos.**	**Blooms Taxonomy**	Batch . No
1.	8/3/22	3	Bernoulli's theory, Venturimeter, Rectangular notch experiments	COB's :1,2,,4 CO's : 1,3,4	K4	B1,B2,B3, B7B4,B5
2.	9/3/22	3	Bernoulli's theory, Venturimeter, Rectangular notch calculations	COB's :1,2,,4 CO's : 1,3,4	K4	B8,B9,B10,B11,,B12
3.	15/3/22	3	Calibration of Orifice meter.**:** Impacts of jets on vanes.	COB's :1,2,4 CO's : 1,3,4	K4	B1,B2,B3, B7B4,B5
4.	16/3/22	3	Calibration of Orifice meter.**:** Impacts of jets on vanes. Notch	COB's :1,2,4 CO's : 1,3,4	K4	B8,B9,B10,B11,,B12
5.	22/3/22	3	Reynolds experiment Laminar Flow through pipes. Reynolds experiment Turbulent	COB's :1,2,4 CO's : 1,3,4	K4	B8,B9,B10,B11,,B12

			flow through pipes			
6.	23/3/22	3	Pelton wheel turbine. Hydraulic Jump	COB's :1,2,4 CO's : 1,3,4	K4	B1,B2,B3, B7B4,B5
7.	29/3/22	3	Pelton wheel turbine. Hydraulic Jump,	COB's :1,2,4 CO's : 1,2,4	K4	B8,B9,B10,B11,,B12
8.	30/3/22	3	Multi stage centrifugal pump.	COB's :1,2,4 CO's : 1,2,4	K4	B1,B2,B3, B7B4,B5
9.	5/4/22	3	Major losses in pipe flow.	COB's :1,4 CO's : 1,2,4	K4	B8,B9,B10,B11,,B12
10.	6/4/22	3	Multi stage centrifugal pump.		K4	B8,B9,B10,B11,,B12
11.	12/4/22	3	Major losses in pipe flow.	COB's :1, 4 CO's : 1,2,4	K4	B1,B2,B3, B7B4,B5
12.	13/4/22	3	Minor losses in pipes due to sudden enlargement	COB's :1,4 CO's : 1,2,4	K4	B8,B9,B10,B11,,B12
13.	19/5/22	3	Minor losses in pipes due to sudden enlargement and contraction	COB's :1,4 CO's : 1,2,4	K4	B1,B2,B3, B7B4,B5
14.	20/5/22	3	Calibration of Rectangular notch.	COB's :1,2,4 CO's : 1,2,3,4	K4	B1,B2,B3, B7B4,B5
15.	26/5/22	3	Calibration of Triangular notch.	COB's :1	K4	B8,B9,B10,B11,,B12
16.	27/5/22	3	Revision of 1st cycle experiments	CO's : 1	K4	B1,B2,B3
17.	21/6/22	3	Bernoulli's theorem experiment	COB's :1,2,4 CO's : 1,2,3,4	K4	B4,B6,B7

18.	22/6/22	3	Minor losses in sudden contraction in all pipe lines for lateral entry students	COB's :1,4 CO's : 1,2,4	K4	B5,B6
19.	28/6/22	3	Minor losses in sudden enlargement in all pipe lines for lateral entry students	COB's :1,4 CO's : 1,2,4	K4	B1,B2,B3,B4
20.	29/6/22	3	Rectangular notch and Triangular Notch experiment for lateral entry students	COB's :1,2,4 CO's : 1,3,4	K4	B5,B6,B7
21.	30/6/22	3	Venturimeter and Orificemeter experiment for lateral entry students	COB's :1,2,4 CO's : 1,3,4	K4	B1,B2,B3

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Institute of Engineering and Technology Department of Civil Engineering

COURSE SCHEDULE

Academic **Y**ear : 2021-2022

Semester : II / II

Name of the Program: B. Tech Year: II Section:A1 BATCH

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering

Designation: ASST.PROFESSOR

The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	Introduction and Demonstration	8/3/22	9/3/22	03
2.	Exercise-I & Exercise-II	10.12.2021	16/3/22	09
3.	Exercise-III & Exercise-IV	15/3/22	23.11.2021	09
4.	Exercise V& Exercise-VI	23/3/22	6/4/22	03
5.	Exercise-VII and Exercise VIII	13/4/22	19/5/22	09
	Exercise-IX and Exercise X	20/5/22	26/5/22	09
7.	Revision of Exercise- Experiments	27/5/22	30/6/22	06

1. Total No. of Instructional periods available for the course: **48** Hours / Period

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Institute of Engineering and Technology Department of Civil Engineering

COURSE SCHEDULE

Academic **Y**ear : 2021-2022

Semester : II / II

Name of the Program: B. Tech Year: II Section:A2 BATCH

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering

Designation: ASST.PROFESSOR

The Schedule for the whole Course / Subject is:

S. No.	Description	Duration (Date)		Total No. of Periods
		From	To	
1.	Introduction and Demonstration	09/03/2022	23/03/2022	03
2.	Exercise-I & Exercise-II	16/03/2022	30/03/2022	09
3.	Exercise-III & Exercise-IV	06/04/2022	20/04/2022	09
4.	Exercise V& Exercise-VI	13/04/2022	27/04/2022	03
5.	Exercise-VII and Exercise VIII	25/05/2022	08/06/2022	09
	Exercise-IX and Exercise X	01/06/2022	15/06/2022	09
7.	Revision of Exercise- Experiments	22/06/2022	22/06/2022	06

1. Total No. of Instructional periods available for the course: **48** Hours / Periods

Gokaraju Total No. of Instructional periods available for the course: **48** Hours / Period

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

Academic **Y**ear : 2021-2022
Semester : II / II
Name of the Program: B. Tech Year: II Section:A2 BATCH
Course/Subject: FM & HM LAB Course Code: GR20A2022
Name of the Faculty: Mr S.Venkatacharyulu/Mr. Rathod Ravinder
Dept: Civil Engineering
Designation: ASST.PROFESSOR

The Course plan for the whole Course / Subject is:

Exercise No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	Blooms Taxonomy	References (SM Lab Manual) Page Nos.:
1	1	08/03/2022	3	**Task-1:** Verification of Bernoulli's Theorem	Cob :3,2 CO: 3,2	K3	1 to 5
	2	15/03/2022	3	**Task-2:** Calibration of Venturi meter	Cob :1 CO: 1,2	K5	11 to 14
	3	22/03/2022	3	**Task-3:** Calibration of Orifice meter.	Cob :2 CO: 1,5,	K3	6 to 10
2	4	29/03/2022	3	**Task-4:** Impacts of jets on vanes	Cob:1 CO:1,4,5	K5	23 to 29
	5	05/04/2022	3	**Task-5:** Reynolds experiment Laminar Flow through pipes.	Cob 2 CO:1,5	K4	52 to 55
	6	12/04/2022	3	6 Reynolds experiment Turbulent flow through pipes.	Cob 2 CO:1,5	K5	59 to 64
3	7	10/05/2022	3	**Task7 :** Multi stage centrifugal pump.	Cob :3 CO:3	K4	71 to 76
	8	17/05/2022	3	**Task-8:** Major losses in pipe flow	Cob:4 CO:4	K3	15 to 22

	9	24/05/2022	3	**Task-9:** Minor losses in pipe (Hydraulic losses due to sudden enlargement of pipe).	Cob :5 CO:5	K4	33 to 37
	10	31/05/2022	3	**Task-10:** Minor losses in pipe (Hydraulic losses due to sudden contraction of pipe).	Cob :1 CO:1,2	K3	45 to 51
4	11	07/06/2022	3	**11:** Pelton wheel turbine.	Cob :2 CO:2	K4	41 to 44
	12	14/06/2022	3	**Task-12:** Hydraulic Jump.	Cob :2 CO:2,4,5	K4	79 to 82
	13	21/06/2022	3	**Task:** Calibration of Rectangular notch.	Cob :5 CO:5	K4	85-86
	14	28/06/2022	3	**:** Calibration of Rectangular notch.	Cob :5 CO:5	K4	85-86

Signature of HOD

Signature of faculty

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

Academic **Y**ear : 2021-2022

Semester : II / II

Name of the Program: B. Tech Year: II Section:A1BATCH
Course/Subject: FM & HM LAB Course Code: GR20A2022
Name of the Faculty: Mr S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering
Designation: ASST.PROFESSOR
The Course plan for the whole Course / Subject is:

Exercise No.	Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	Blooms Taxonomy	References (SM Lab Manual) Page Nos.:
1	1	09/03/2022	3	**Task-1:** Verification of Bernoulli's Theorem	Cob :3,2 CO: 3,2	K3	1 to 5
	2	16/03/2022	3	**Task-2:** Calibration of Venturi meter	Cob :1 CO: 1,2	K3	11 to 14
	3	23/03/2022	3	**Task-3:** Calibration of Orifice meter.	Cob :2 CO: 1,5,	K3	6 to 10
2	4	30/03/2022	3	**Task-4:** Impacts of jets on vanes	Cob:3 CO:1,4,5	K4	23 to 29
	5	06/04/2022	3	**Task-5:** Reynolds experiment Laminar Flow through pipes.	Cob 2 CO:1,5	K4	52 to 55
	6	13/04/2022	3	6 Reynolds experiment Turbulent flow through pipes.	Cob 2 CO:1,5	K4	59 to 64
3	7	20/04/2022	3	**Task7 :** Multi stage centrifugal pump.	Cob :3 CO:3	K4	71 to 76
	8	27/04/2022	3	**Task-8:** Major losses in	Cob:4 CO:4	K3	15 to 22

				pipe flow			
	9	11/05/2022	3	**Task-9:** Minor losses in pipe (Hydraulic losses due to sudden enlargement of pipe).	Cob :5 CO:5	K4	33 to 37
	10	18/05/2022	3	**Task-10:** Minor losses in pipe (Hydraulic losses due to sudden contraction of pipe).	Cob :1 CO:1,2	K3	45 to 51
4	11	25/05/2022	3	**11:** Pelton wheel turbine.	Cob :2 CO:2	K4	41 to 44
	12	01/06/2022	3	**Task-12:** Hydraulic Jump.	Cob :2 CO:2,4,5	K4	79 to 82
	13	08/06/2022	3	**Task13:** Calibration of Rectangular notch.	Cob :5 CO:5	K4	84-85
	14		3	**Task** 14Calibration of Triangular notch.	Cob :3,4 CO:3,4	K4	86-87

Signature of HOD

Signature of faculty

SCHEDULE OF INSTRUCTIONS

LESSON PLAN

Academic **Y**ear : 2021-2022

Semester : II / I

Name of the Program: B. Tech Year: II Section:A

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr. S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering

Designation: ASST.PROFESSOR

Lesson No.	Date	No. of Periods	Topics / Sub-Topics	Objectives & Outcomes Nos.	Blooms Taxonomy
1.	08/03/2022 , 09/03/2022	3	**Task-1:** Verification of Bernoulli's Theorem	Cob :1 CO: 1	K2
2.	15/03/2022, 16/03/2022	3	**Task-2:** Calibration of Venturi meter	Cob :2 CO: 1,2	K2
3.	22/03/2022, 23/03/2022	3	**Task-3:** Calibration of Orifice meter.	Cob :2 CO: 1,5,	K3
4.	29/03/2022, 30/03/2022	3	**Task-5:** Imapct of jets	Cob:3 CO:1,4,5	K4
5.	05/04/2022.06/04/2022	6	Reynolds experiment Turbulent flow through pipes.	Cob 3 CO:1,5	K4

6.	12/04/2022, 13/04/2022	3	. **Task-6:** Reynolds experiment Laminar Flow through pipes	Cob 3 CO:1,5	K4
7.	19/04/2022. 20/04/2022	3	**Task** 7 Reynolds experiment Turbulent flow through pipes.	Cob :3 CO:3	K4
8.	26/04/2022,27/04/2022	3	**Task8 :** Multi stage centrifugal pump.	Cob:4 CO:4	K4
9.	10/05/2022, 11/05/2022	3	**Task-9:** Major losses in pipe flow	Cob :5 CO:5	K4
10.	17/05/2022, 18/05/2022	3	**Task-10:** Minor losses in pipe (Hydraulic losses due to sudden enlargement of pipe).	Cob :5 CO: 5	K4
11.	14/06/2022, 15/06/2022	3	**Task-11:** major losses in pipe (Hydraulic losses due Friction contraction of pipe).	Cob :4 CO: 4	K5

12.	21/06/2022, 22/06/2022	3	**12:** Pelton wheel turbine.	Cob :5 CO: 1,5,	K5
13.	28/06/2022, 29/06/2022	3	**Task-13:** Hydraulic Jump.	Cob:5 CO:1,4,5	K5
.14	07/07/2022, 08/07/2022	3	**Task14: Task-Trurbines and M.pupms**	Cob 2 CO:1,5	K5

Batch Wise Roll Numbers (A2)

Batch 1: 37,42,47	Batch 5: 36,38,39	Batch 9: 55,56,57
Batch 2: 50,51,53	Batch 6: 40,41,43	Batch 10: 58,59,60
Batch 3: Le3. Le4, Le5	Batch 7: 44,46,48	Batch 11: Le1, Le2
Batch 4: 33,34,35	Batch 8: 49,52,54	

Batch Wise Roll Numbers (A1)

Batch 1: 17,19	Batch 5: 7,8,9	Batch 9: 21,22,23
Batch 2: 31,32	Batch 6: 10,11,12	Batch 10: 24,25,26
Batch 3: 1,2,3	Batch 7: 13,14,15	Batch 11: 27,28
Batch 4: 4,5,6	Batch 8: 16,18,20	Batch 12: 29,30

Gokaraju Rangaraju Institute of Engineering and Technology
Department of Civil Engineering
COURSE COMPLETION STATUS

Academic **Y**ear : 2021-2022

Semester : II / I

Name of the Program: B. Tech Year: II Section:A2

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr. S.Venkatacharyulu/Mr. Rathod Ravinder/

Dept: Civil Engineering

Actual Date of Completion & Remarks, if any

Units	Remarks	No. of Objectives Achieved	No. of Outcomes Achieved
Exercise - I	Covered on time	1,2,5	1,2,5
Exercise – II	Covered on time	1,3,4,5	1,3,4,5
Exercise – III	Covered on time	1,3,4,5	1,3,4,5
Exercise - IV	Covered on time	1,2,5	1,2,5

Signature of HOD Signature of faculty

Date: Date:

Gokaraju Rangaraju Institute of Engineering and Technology Department of Civil Engineering

EVALUATION STRATEGY

Academic **Y**ear : 2021-2022

Semester : II / I

Name of the Program: B. Tech Year: II Section:A2

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr. S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering Actual Date of Completion & Remarks, if any

Designation:

1. TARGET:
   a) Percentage for pass: 100%
   b) Percentage of class: 95%

First class with distinction	35
First class	20
Pass class	08
Total strength	64

2. **COURSE PLAN & CONTENT DELIVERY**
   - 96 practice classes held for detailed demonstration of experiments and for analyzing real time experiments in the lab.

3. **METHOD OF EVALUATION**

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

3.2 ☐ Assignments/Seminars

3.3 ☐ Mini Projects

3.4 ☐ Quiz

3.5 ☐ Semester/End Examination

3.6 ☐ Others

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

Signature of HOD Signature of faculty

Gokaraju Rangaraju Institute of Engineering and Technology Department of Civil Engineering

RUBRICS OF THE COURSE

Academic **Y**ear : 2021-2022

Semester : II / I

Name of the Program: B. Tech Year: II Section:A2

Course/Subject: FM & HM LAB Course Code: GR20A2022

Name of the Faculty: Mr. S.Venkatacharyulu/Mr. Rathod Ravinder Dept: Civil Engineering

Designation: ASST.PROFESSOR **Dept.:** Civil Engineering
Designation: Professor/Assistant Professor
Objective: To learn, conduct and assess the practical aspects of various experiment on materials like steel, copper, brass alloys & etc.

Student Outcome: learn experimental procedures and implement the theoretical knowledge to assess the result of the particular experiments, again experience to test the different material to prepare or to use for construction purpose or parts of machinery.

Gokaraju Rangaraju Institute of Engineering and Technology (Autonomous)

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

RUBRIC TEMPLATE

		Beginning	Developing	Reflecting Development	Accomplished	Exemplary	Score (Numerical)
Name of the student	Performance Criteria	1	2	3	4	5	
20245A0105 PATERU MOUNA	The level of Knowledge in obtaining height of manometer, measuring time in rise	Low level of Knowledge in obtaining height of manometer, measuring time in rise	Able to understand Knowledge in obtaining height of manometer, measuring time in rise	Ability to measure height of manometer, measuring time in rise of water	Full knowledge in obtaining height of manometer, measuring time in rise	Analyzing all practical aspects of obtaining height of manometer, measuring time in rise	5

	of water	of water	of water		of water	of water	
	The level of knowledge on application in irrigation and water distribution system and analyzing boundary layers in real time.	Low level of knowledge on application in irrigation and water distribution system and analyzing boundary layers in real time.	Able to understand application in irrigation and water distribution system and analyzing boundary layers in real time.	Ability to apply knowledge in application in irrigation and water distribution system and analyzing boundary layers in real time.	Full knowledge in application in irrigation and water distribution system and analyzing boundary layers in real time.	Analyzing irrigation and water distribution system and analyzing boundary layers in real time.	4
				Average			4

Gokaraju Rangaraju Institute of Engineering and Technology Department of Civil Engineering

MAPPINGS

GR20A2015/ **Solid Mechanics Lab**	**Course Outcomes**				
Course Objectives	1	2	3	4	5
1	X				
2		X			
3			X		
4				X	
5					X

Assessments

1. Assignment 2. Internal Examination 3. External Examination

4. Practical Projects 5. Viva

GR20A2022 **Fm And HM Lab**	**Course Outcomes**				
Assessments	1	2	3	4	5
1					
2	X	X	X	X	X
3	X	X	X	X	X
4	X	X	X	X	X
5	X	X	X	X	X

GR20A2022 **Fm and HM Lab**	**Course Objectives**				
Assessments	1	2	3	4	5
1					
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 Objectives-Course Outcomes Relationship Matrix

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

Course outcomes-program outcomes relation (contributes: High, Medium and Low)

FM & HM LAB Co And PEO	a	b	c	d	E	f	g	h	i	j	k	l	PSO's 1	PSO's 2
Estimate the coefficient of discharge through venturimeter, orifice meter.	H	M	M	M								M	H	M
2. Distinguish between losses of head due to contraction and enlargement.	H	M			M						M		H	M
3. Predict the major losses in pipes.	H	M			M	M					M		H	M
4. Differentiate the laminar, turbulent and transitional flows.	H	M	M		M	M		M		M			H	M
5. Calculate the discharge through orifice, mouthpiece and wires.	H	M		M	M			M		M			H	M

Course Objectives- Program Educational Objectives (PEOs)- Couse Outcomes Relationship Matrix

P-Objectives (PEOs) / Course-Outcomes	1	2	3	4
1	X			
2	X			
3		X		X
4		X	X	
5	X		X	X

Assessments in Program Outcomes(POs) Relationship Matrix

Assessments:

1) ASSIGNMENT
2) INTERNAL EXAMINATION
3) EXTERNAL EXAMINATION
4) PRACTICAL PROJECTS
5) VIVA

P-Outcomes / Assessments	a	b	C	d	e	f	G	h	i	j	k	l
1	X	X	X		X	X		X			X	X
2	X	X	X		X	X						X
3	X	X	X		X	X					X	X
4	X	X	X		X	X	X	X			X	X
5		X		X		X					X	X

Assessments in Program Educational Objectives (PEOs) Relationship Matrix

Assessments:

1) ASSIGNMENT
2) INTERNAL EXAMINATION
3) EXTERNAL EXAMINATION
4) PRACTICAL PROJECTS
5) VIVA

Internal Exam and External Questions

Fluid Mechanics and Machinery Lab – Viva Question
ASSIGNMENT SHEET

1Differentiate between Absolute and gauge pressures. C03
2.Mention two pressure measuring instruments. C02
2. What is the difference weight density and mass density? C02
3. What is the difference between dynamic and kinematic viscosity? C01
4. Differentiate between specific weight and specific volume. C02
5. Define relative density. C01
6. What is vacuum pressure?
7. What is absolute zero pressure?
8. Write down the value of atmospheric pressure head in terms of water and Hg. C03
9. Differentiate between laminar and turbulent flow. C05
10. How will you classify the flow as laminar and turbulent? C04
11. Mention few discharge measuring devices C01
12. Draw the venturimeter and mention the parts. C04

13. Why the divergent cone is longer than convergent cone in venturimeter? C01
14. Compare the merits and demerits of venturimeter with orifice meter.
15. Why Cd value is high in venturimeter than orifice meter? C01
16. Dsicuss t is impact of jets ? C03
17. What do you mean by notch discuss? C04
18. Define coefficient of discharge. C02
19. Write down Darcy -weisbatch's equation. C05
20. What is the difference between friction factor and coefficient of friction? C04
21. What do you mean by major energy loss? C05
22. List down the type of minor energy losses. C05

What are the instruments used to measure the discharge of a fluid in a pipe?

How to measure the discharge of fluid in an open channel? C01

Unit of discharge

Discharge equation for venture meter

Discharge equation for orifice meter

Name the devices used to measure the pressure difference in a pipe flow.

State Bernoullis theorem. C04

What is vena contracta? C03

compare the relative merits and demerits of orifice meter and venturimeter.

What is self priming? C04

Describe hydraulic jump? C05

.Discuss Pelton wheel ? C05

What is the use of Venturimeter? C01

Why the divergent cone is longer than convergent cone in venturimeter?

Why Cd value is high in venturimeter than orifice meter? C03

Gokaraju Rangaraju Institute of Engineering and Technology

(Autonomous)

Bachupally, Kukatpally, Hyderabad

DEPARTMENT OF CIVIL ENGINEERING

Fm and HM (GR20A2022) –Internal Marks

S. No	Roll. No	Name of the Student	Marks (30M)
1	20241A0101	AADHI SRIKAR RAO	25
2	20241A0102	ABHIRAM SAI YADAV	15
3	20241A0103	BACCHUGUDAM RITHVIK	17
4	20241A0104	BANDLA NAVEEN	24
5	20241A0105	B.PRANAV SAI	21
6	20241A0106	BHATTU SUPREETH CHAKRAVARTHY	25
7	20241A0107	BHUPATHIRAJU	21
8	20241A0108	BOINI HEMANTH	16
9	20241A0109	CHALLA AJAY KUMAR	21
10	20241A0110	DONABOINA SRI HARI	21
11	20241A0111	EPPA ARNAV	17
12	20241A0112	G L N RAGHURAMAN	28
13	20241A0113	GANDLA HARSHITH KUMAR	25
14	20241A0114	GUGGILLA SHASHANK	17
15	20241A0115	GUNDA SRIKANTH	23
16	20241A0116	JANGILI SRAVAN KUMAR	22
17	20241A0117	JANJIRALA SRUTHI	21
18	20241A0118	JARAPULA JAYANTH	24
19	20241A0119	K NIKHITHA	25
20	20241A0120	K SANJEEV KUMAR	8
21	20241A0121	K.KONDAL	23
22	20241A0122	KAMMAMPATI UDAYKIRAN	25
23	20241A0123	KARNE SRITHAN	23
24	20241A0124	KUNCHALA VARUN KUMAR	26
25	20241A0125	KUNTA NITHIN REDDY	28
26	20241A0126	M PAVAN KALYAN	17
27	20241A0127	MERE MAHESH	26
28	20241A0128	MOHAMMED AHMED	25
29	20241A0129	MOTHUKURI LAXMAN	28
30	20241A0130	MOTTADI ADITYA TEJA	15

S. No	Roll. No	Name of the Student	Marks (70M)
31	20241A0131	MULA SUSHMA SRI	28
32	20241A0132	NAYINI SWETHA	23
33	20241A0133	PAIDIPALLY BHARATH	25
34	20241A0134	P.SAI KIRAN REDDY	27
35	20241A0135	PASNOOR PAVAN PRATHAP	15
36	20241A0136	PATHLAVATH SHIVA NAYAK	26
37	20241A0137	PEDDIBOINA ANUSHA	21
38	20241A0138	POREDDY ABHINAV REDDY	26
39	20241A0139	PULLAGURA SANTHOSH	26
40	20241A0140	RACHALA BHARATH	26
41	20241A0141	RADHARAPU SHAJI KUMAR	24
42	20241A0142	RAMAVATH ROJA	24
43	20241A0143	RATHLAVATH SAIRAM NAYAK	23
44	20241A0144	RAVI TEJA PASUNUTHI	22
45	20241A0146	SADDI SHRIANK REDDY	21
46	20241A0147	SATHVIKA NARLA	25
47	20241A0148	SOKKULA KOUSHIKREDDY	27
48	20241A0149	SRIRAM PANDAVULA	15
49	20241A0150	T.BHARGAVI	22
50	20241A0151	T.BHUVANESHWARI	21
51	20241A0152	S.TEJA RETIESH REDDY	28
52	20241A0153	TEJAVATH KALYANI	29
53	20241A0154	TELLAPURAM PRUDHVI RAJ	24
54	20241A0155	THADEM ROHITH	26
55	20241A0156	THUMMALA RAJASHEKAR	24
56	20241A0157	UVSGR KAMESWARA SAI	27
57	20241A0158	SREERAM VATTEM	25
58	20241A0159	V VIKESH	23
59	20241A0160	VENNAM SRIKAR	25
60	21245A0101	GUMADAVELLI ARUN KUMAR	28
61	21245A0102	KADIRABAD SRIRAM	15
62	21245A0103	MANIKONDA NIKITHA	26
63	21245A0104	PARIDULA PRATHYUSHA	21
64	21245A0105	PATERU MOUNA	29