

Accredited by NAAC with 'B+' Grade, 2(f) & 12B Status Institution by UGC

IG Valley, Madurai Main Road, Manikandam, Tiruchirappalli - 620012

NAAC DOCUMENTS

QUALITY INDICATOR FRAME WORK

CRITERION – 1

CURRICULAR ASPECTS

SUBMITTED BY

IQAC

INTERNAL QUALITY ASSURANCE CELL INDRA GANESAN COLLEGE OF ENGINEERING





Criteria 1	Curricular Aspects	100
------------	--------------------	-----

1.1 Curricular Planning and Implementation (20)

1.1.1 The Institution ensures effective curriculum planning and delivery through a well-planned and documented process including Academic calendar and conduct of continuous internal Assessment

Table of Content

S. No	Description
1.	Preface of the Course File
2.	Review of Course File
3.	Faculty Time Table
4.	Course Plan
5.	Course Committee Meeting
6.	Content Beyond Syllabus
7.	Rubrics Base Evaluation
8.	Academic Audit Form
9.	Student Feed Back on Faculty
10.	Internal Assessment Schedule
11.	Question Paper
12.	Answer Key
13.	Sample Answer Sheet
14.	Co Based Mark Entry
15.	Root Cause Analysis
16.	Retest Question Paper
17.	Retest Sample Answer Sheet
18.	Retest Co Based Mark Entry

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF MECHANICAL ENGINEERING

PREFACE OF THE COURSE FILE

Batch

: 2016-2020

Academic Year

: 2020-2021 / EVEN

Program

: MECHANICAL ENGINEERING

Year & Semester

: 3nd Year / 6th Semester

Course Code

: ME8694

Name of the Course

: Hydraulics and Pneumatics

Faculty in-charge

: Mr.R. Ganesh, AP/Mechanical

Signature of the Faculty in-charge

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

Register Number:	
------------------	--



IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India (Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

	Internal Assessn	nent Exam - II	Date	M	arks 50
Course o	code ME 8694	Course Title	Hydraulics and	Pneumatics	·
Regulati	on 2021	Duration	90 minutes	Academic Year	2020-21
Year	ш	Semester	VI	Department	Mechanical Engg
COURS	E OUTCOMES		tiotion-record districtions of the party of		GO
CO1:	Explain the Fluid pov	er and operation of different	types of pumps		
CO2:	Summarize the featur	es and functions of Hydrauli	c motors, actuators and	Flow control valves.	30000000
CO3:		ypes of Hydraulic circuits as		**	-1/466300
CO4:	Explain the working of	f different pneumatic circuit	s and system	— personalistic - e- — samppe/pepron - even	PF
CO5:	Summarize the variou	s trouble shooting methods a	and applications of hydr	aulic and pneumatic syste	ems.
CO6:	Explain the application	ns of Hydraulic and Pneuma	tic systems.	A SALLANDER PROPERTY OF SALLANDER	de tillibilitäin tekin skajin yhdynyt din din kännän liiliinna mita adapan ainn kinstini liikäkäisilänä, ja

Q.No.	Question	CO	BT
	PART A (Answer all the Questions $10 \times 2 = 20 \text{ Marks}$)		
1	What is the function of pump in hydraulic system?	CO313.2	K1
2	What is the purpose of baffle plate in a fluid reservoir?	CO313.2	K1
3	State the reason why positive displacement pumps found suitable for fluid power	CO313.2	K1
	application.	00313.2	1
4	Distinguish between positive and variable displacement pumps.	CO313.2	K.2
5	Name two designs of vane pumps?	CO313.2	K1
6	How can you vary the displacement in an axial piston pump?	CO313.2	KI
7	Define the volumetric efficiency of the pump	CO313.2	K1
8	Define the mechanical efficiency of a pump?	CO313.2	K1
9	What are the types of hydraulic actuators?	CO313.2	K1
10	What are the advantages of double acting cylinder over single acting cylinder?	CO313.2	K1
	PART B		
	(Answer all the Questions 2 x 10 = 20 Marks)		
11a	Explain how positive displacement pumps build pressure compared to rotor	CO313.2	K2
	dynamic pumps. What are the advantages of positive displacement pump?		
	OR	. previous manual	
116	A gear pump has 75 mm outside diameter, 50mm inside diameter and 25mm width. If the volumetric efficiency is 95 % at rated pressure what is the actual flow rate? N=1200 rpm.	CO313.2	K2
12a	Enumerate the working principles of balanced vane pump with neat sketch. Also write the advantages and disadvantages?	CO313.2	K2
	OR		
12b	Explain the working of a radial piston pump with a neat sketch. Also write an	CO313.2	K2
	expression for the theoretical displacement per revolution of the crank?	***************************************	
	PART C		
12.	(Answer all the Questions 1 x 10 = 10 Marks)	1	
13a	A rotary vane air motor has a displacement volume of 80 cm ³ /rev and operates at	CO313.2	K2
	1750rpm using 700 kPa gauge pressure air. Calculate the standard ml/min rate of	777	
	consumption and kW power output of the motor. Assume the temperature remains constant?	**************************************	
	OR	1	
	If a hydraulic circuit has pump inlet and exit ports interchanged, unloading valve given internal pilot .What happens? Explain.	CO313.2	K2

Course Faculty
(Name /Sign / Date)

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering IG Valley, Madurai Main Road Manikandam, Trichy-620 012. (Name / Sign / Date)



Accredited by Nechanical Engineering

Department of Mechanical Engineering

II Year TimeTable - Even Semester 2020-2021

Year / Sem: IV/ VIII

CC: Mr. R. Ganesh / AP / MECH

Hall No.: LH 301

W. S. W.		2	3	4			9			
AVA	0 10 10 00	10.05			To last	STREET, STREET		The same	THE REAL PROPERTY.	& (CCA/SCC)
Sile and	CD'OT CT C	10.55	11.10-12.00	12.00-12.45	1000	01 20-02 10 00	2.10-03.00	10000	03 10,04 00	Ottobacon
MON	TATS	CIMS	TATS	POM	1	PROJECT WORK	VORK	20	PROJECT	SALCO-OVINA
TELE	POM	CIME))	+2-meananeages replacementary		2	WORK	CCA/SCC
		Y	IAID	PRUJECT WORK	2 (PROJECT WORK	VORK	ш.	PROJECT	CCA/SCC
WED	PROJEC	PROJECT WORK K	POM	TATC) 2		***************************************	Y	WORK	
		No.		OIUI		CIMS	TATS	×	TATS	CCA/SCC
THU	PROJEC	PROJECT WORK	PROJ	PROJECT WORK		PROJECT WORK	VORK		PROJECT	77.0
Tun	DDOTECT	DDOIECT WORK		Table and the second se			The state of		WORK	CCA/SCC
	TIMOTE	I WORK	r PROJ	PROJECT WORK		POM	CIMIS		OT A T	The company of the control of
			materials of the control of the cont	The same and		Net Policy September 2011			IAIS	CCA/SCC
							·	THE PERSON NAMED IN COLUMN TWO IS NOT THE OWNER, THE OW	To free part and a second and a	

0	UNIE NAME. ERP 1		KDITIS/	of the second se
MG8591 Principle of Management	IGCENSO			
Committee Integrated Monifering	Recorded agraphases		3/45	Mr.K.N.Prabahar, AP/Mech
(Professional Elective-IV)	runig systems IGCE0308		3/45	Mr. R.Ramesh Bahn HOD Moch
ME8811 Project Work	Andrew Jan Arten in the same of the control of the	* - 's		Olympia in the second s
And the second s	IGCE0308		10/300	Mr. R.Ramesh Bahii HOD/Mech
CCA / SCC	Management of the control of the con			TOTAL
TATS	http://docume.com/projection/proj	000 0	o nours/weck	
TOTAL	Officerately. Film by semant should have bringery the property of the property	7 hor	7 hours/week	erminiple organically and hamperson description of the second of the sec
opphysical to comment the comment of	· · · · · · · · · · · · · · · · · · ·	7	16/390	e international state of the st

Dr. G. Balakrishnan, M.E., Ph.D., Principal



Madural Main Road (NH-45B). Manikandam, Tiruchirapalli. 620 012
Approved by AlCTE, Newbelhi & Affillstod do Anna University, Chennal

II Year TimeTable - Even Semester 2020-2021 Department of Mechanical Engineering

CC: Mr. R. Manickam / AP/ MECH

Year / Sem: III / VI

10.05-10.85

9.18-10.05

DAY

CAD/CAM

DIS

CAD/CAM

IN CHARGINA

HMT FEA

DIS FEA

TUE

AE FEA

WED

LIHIO

AE

MOM

	HONOR WILLIAM AND MILECIA		7	11am INO.: L.H. 302	7
1221	*	9	はなり		ò
	12.00-12.45	01.70-02.10 02.10-03.	00	03.10-64.00	
1	H&P	Professional Communicati	84 5	CATACARE	
	FEA	Lab	e bi	CAUCAM	_
1	AD	DWII DWII	*	DTS	
		CADICAM DIS	×	H&P	_
- 3	CAD/CAM LAB	CAD/CAM LAB		CAD/CAMTAB	1
()	D&F PROJECT	D&B DBOTTON		מעק האינו מאוני	
- 1		DOCE PROJECT		D&F PROTECT	

84.00-05.00 S(CCA/SCC

CCA/SCC CCA/SCC CCA/SCC CCA/SCC

D&F PROJECT

CCA/SCC

Design of Transmission Systems IGCE0360 3/45 Mr. J.Sebastin Joyal, AP/Mech Computer Aided Design and Manufacturing IGCE0383 3/45 Mr. K.N. Prabahar, AP/Mech IGCE0411 4/75 Dr. GP-Arul, Prof/ Mech Finite Element Analysis IGCE0384 3/45 Mr. R. Ramesh Babu, HOD/Mech Hydraulics and Pneumatics IGCE0384 3/45 Mr. R. Ganesh, AP/Mech IGCE0308 3/45 Mr. R. Ganesh, AP/Mech IGCE0308 2/60 Mr. R. Ganesh, AP/Mech IGCE0308 2/60 Mr. R. Ramesh Babu, HOD/Mech I			-	
cms IGCE0360 3/45 Manufacturing IGCE0383 3/45 IGCE0411 4/75 1/65 IGCE0384 3/45 1/65 IGCE0308 3/45 1/60 IGCE0308 2/60 1/30 IGCE0308 2/60 1/30 IGCE0308 2/60 1/30 IGCE0308 2/4450	COURSE NAME	EMP ID	EDITS/	STAFF IN-CHARGE
IGCE0383 3/45 IGCE0411 4/75 IGCE0384 3/45 IGCE0308 3/45 IGCE0384 2/60 IGCE0384 2/60 IGCE0308 2/60 IGCE0308 2/60 IGCE0308 2/40 A/450	Computer Aided Degion and Manage	IGCE0360		Mr. J.Sebastin Joyal AP/Mech
IGCE0411 4/75 IGCE0384 3/45 IGCE0308 3/45 IGCE 3/45 IGCE0384 2/60 IGCE0389 2/60 IGCE0308 2/60 IGCE 1/30 S/Week 24/450	Heat and Mass Transfer	IGCE0383		Mr.K.N.Prahahar AP/Mech
IGCE0384 3/45 IGCE0308 3/45 IGCE0308 3/45 IGCE0384 2/60 IGCE0308 2/60 IGCE0308 2/60 IGCE 1/30 24/450	Cy Finite Element Apalysis	IGCE0411		Dr. G.P. Arul, Prof./ Mech
IGCE0308 3/45 IGCB 3/45 IGCB0384 2/60 IGCB0308 2/60 IGCB0308 2/60 IGCB 1/30 24/450	With Hydraulics and Prenimation	IGCE0384		Mr. R.Ramesh Bahn HOD/Mach
IGCE 3/45 1GCE0384 2/60 1GCE0308 2/60 1GCE 1/30 1GCE 1/30 24/450	Automobile Engineering	IGCE0308	-	Mr.R.Ganesh, AP/Mech
IGCE0384 2/60 IGCE0308 2/60 IGCB 1/30 5/Week 24/450	81 CAD / CAM Laboratory	IGCE		New staff, AP/Mech
IGCE0308 2/60 IGCB 1/30 S/Week	982 Design and Fabrication Project	IGCE0384	-	Mr.R.Ganesh. AP/Mech
IGCE 1/30 5/Week 24/450	81 Professional Communication	IGCE0308		Mr. R.Ramesh Bahn, HOD/Mech
5/Week 24/450	CCA / SCC	IGCE		Ms. Maria Kiruba Privadharshini AD/ Co.u
magnite company demand company company company company company company company company company	TOTAL	\$		Commence on strong particular and the Commence and the Co
	emerges december of the control of t		4/450	standarona operationa operationa operational standaronal spatial spat







Accreting Methanical Engineering

Department of Mechanical Engineering

Firm Competer 2020-2021

CC: Mr. J.Sebastin Joyal/AP/MECH

Year/ Sem: II / IV

Hall No.: LH 303

Od not he no	CCA/SCC	CCA/SCC	CCA/SCC	CON ADD	CLASCL
03 19-54 00	KOM	MT-II LAB	SOM/FMM	I AB	37-1747
	8	00 50	4		
02.10-03.00	EM	ILAB	MLAB	WLAB	
01.20-02.10	MT-II	MFT-II LAB	SOM/FIMM LAB	Adv R&	
2.00-12-45	TE-I	MT-II LAB N	M/FMM C	SINIM	
11.10-12.06 12.0		TE-1 MT	-	H	ŀ
	po a	d bi	K		
10,04-10.55	MT-II	SNM	TE-I	EM	SNIM
				1	
9.13-19.0B	MOS	KOM	SNM	SOM	FM

MA8452	COURSE NAME	KRZID	CREDITS	The state of the s
	Statistics and Numerical Methods	IGCE	4/60	Du C Autolian mane in con-
ME8492	Kinematics of Machinery	7000000	00/4	LA. S. Krimus, Fron. / Sec. H
	to destrict anomaloguestationists, management of destructions of destructions of destructions of destructions of the second of t	ICCE0384	3/45	Mr.R.Ganesh, AP/Mech
ME8451	Manufacturing Technology – II	IGCE0383	3/45	Mr.K.N.Prabahar, AP/Mech
ME8491	Engineering Metalhurgy	ECCE	3/45	Nome of C A DA Lack
CE8395	Strength of Materials for Mechanical Engineering	OSCUBLIZEDI,	2/45	TOWN STORTS OF STREET
ME8403	The second of th	OBCOCOCO.	C#/C	Mr.K. Manickam, A.P./Mech
		IGCE0411	3/45	Dr. G.P. Arul, Prof./ Mech
ME8462	Manufacturing Technology Laboratory II	IGCF0383	2/60	Mr. K. N. Denhahan A. A. A.
CE8381	Strength of Materials and Pluid Mechanics and Machinery I oh	TO CONTROL A S S	3	ANTI- TOTAL PROPERTY OF THE PR
1	AND THE TAX INC. TO SECURE AND THE SECURE AND THE SECURE ASSESSMENT ASSESSMEN	こまりまって	2/60	Dr. G.P.Arul, Prof./ Mech
HS8461	Advanced Reading and Writing	IGCE	1/30	Ms. Maria Kiruba Priyadharshini, AP/ S&H
	CCA / SCC	No. or projection	5 Hours / Week	!K
	TOTAL		30/435	assipation to

Dr. G. Balaknishada, M.E., Ph.D.,



Indra Ganesan

COLLEGE OF ENGINEERING Madural Main Road (NH-45B), Manikandam, Tiruchirapatil- 620 012 Approved by AICTE, NewDelhi & Affiliated to Anna University, Chennal Accredited by NAAC with B+ Grade

Department of Mechanical Enginee	ring
----------------------------------	------

		Course		Semest	-	Lecu	1
S.NO	Staff Name	Code	Course Name	er	Credits	re/	Tot
Į.	•	ME869	2 Finite Element Analysis	VI	3	4	
1	Mr.R.Ramesh Babu HOD/Mech	ME8094	Computer Integrated Manufacturing Systems	vm	3	4	
_	On the state of th	ME8682	2 Design and Fabrication Project	VI	2	4	32
	, (2+2)	ME8811	Project Work	VIII	10	20	
	•	ME8451	Manufacturing Technology - II	, IV	3	4	e-Me
2	Mr.K.N. Prabahar AP/Mech	ME8691	Computer Aided Design and Manufacturing	VI	3	4	
- 1		MG8591	Principles of Management	VIII	3	4	16
•	(3+1)	ME8462	Manufacturing Technology Laboratory - II	IV	2	4	
3	Mr.R.Manickam AP/Mech	CE8395	Strength of Materials	īV	3	4	
	(1+1)	GE8261	Engineering Practices Laboratory	п	2	4	8
1		BE8252	Basic Civil and Mechanical Engineering	П	4	5	
4	Dr. G.P. Arul, Prof./Mech	ME8493	Thermal Engineering- I	īV	3	4	18
		ME8693	Heat and Mass Transfer	VI	4	5	10
-	(3+1)	CE8381	Strength of Materials and Fluid Mechanics and Machinery Lab	IV	2	4	
House		PH8251	Materials Science	П	3	4	
	Mr. R. Ganesh AP/Mech	ME8492	Kinematics of Machinery	IV	3	4	4.5
		ME8694	Hydraulics and Pneumatics	VI	3	4	16
	(3+1)	ME8681	CAD / CAM Laboratory	VI	2	4	
M	Ir.J.Sebastin Joyal AP/Mech (1+0)	ME8651	Design of Transmission Systems	VI	3	4	4
***	-	GE8292	Engineering Mechanics	п	4 !	5	or to assumble.
i de	New staff AP/Mech	ME8491	Engineering Metallurgy	IV	3 4		
		ME8091	Automobile Engineering	VI	3 4		17
	(3+1)	GE8261 1	Engineering Practices Laboratory	п	2 4		*****

HODNIECH

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

OBJECTIVES:

To provide student with knowledge on the application of fluid power in process, construction and manufacturing Industries.

To provide students with an understanding of the fluids and components utilized in modern industrial fluid power system.

To develop a measurable degree of competence in the design, construction and operation of fluid power circuits.

UNIT I FLUID POWER PRINICIPLES AND HYDRAULIC PUMPS

Introduction to Fluid power – Advantages and Applications – Fluid power systems – Types of fluids

- Properties of fluids and selection – Basics of Hydraulics – Pascal's Law – Principles of flow –

Friction loss – Work, Power and Torque Problems, Sources of Hydraulic power: Pumping Theory

– Pump Classification – Construction, Working, Design, Advantages, Disadvantages,

Performance, Selection criteria of Linear and Rotary – Fixed and Variable displacement pumps –

Problems.

UNIT II HYDRAULIC ACTUATORS AND CONTROL COMPONENTS 9
Hydraulic Actuators: Cylinders – Types and construction, Application, Hydraulic cushioning –
Hydraulic motors - Control Components: Direction Control, Flow control and pressure control
valves – Types, Construction and Operation – Servo and Proportional valves – Applications –
Accessories: Reservoirs, Pressure Switches – Applications – Fluid Power ANSI Symbols –
Problems.

UNIT III HYDRAULIC CIRCUITS AND SYSTEMS

Accumulators, Intensifiers, Industrial hydraulic circuits — Regenerative, Pump Unloading, Double-Pump, Pressure Intensifier, Air-over oil, Sequence, Reciprocation, Synchronization, Fail-Safe, Speed Control, Hydrostatic transmission, Electro hydraulic circuits, Mechanical hydraulic servo systems.

UNIT IV PNEUMATIC AND ELECTRO PNEUMATIC SYSTEMS

Properties of air — Perfect Gas Laws — Compressor — Filters, Regulator, Lubricator, Muffler, Air control Valves, Quick Exhaust Valves, Pneumatic actuators, Design of Pneumatic circuit — Cascade method — Electro Pneumatic System — Elements — Ladder diagram — Problems, Introduction to fluidics and pneumatic logic circuits.

Dr. G. Balakrishnan, M.E., Ph.D.,

UNIT V TROUBLE SHOOTING AND APPLICATIONS

9

Installation, Selection, Maintenance, Trouble Shooting and Remedies in Hydraulic and Pneumatic systems, Design of hydraulic circuits for Drilling, Planning, Shaping, Surface grinding, Press and Forklift applications. Design of Pneumatic circuits for Pick and Place applications and tool handling in CNC Machine tools – Low cost Automation – Hydraulic and Pneumatic power packs.

TOTAL:45 PERIODS

OUTCOMES:

Upon the completion of this course the students will be able to

- CO1 Explain the Fluid power and operation of different types of pumps.
- CO2 Summarize the features and functions of Hydraulic motors, actuators and Flow control valves
- CO3 Explain the different types of Hydraulic circuits and systems
- CO4 Explain the working of different pneumatic circuits and systems
- CO5 Summarize the various trouble shooting methods of hydraulic and pneumatic systems
- CO6 Explain the applications of Hydraulic and Pneumatic systems.

TEXT BOOKS:

- 1. Anthony Esposito, "Fluid Power with Applications", Pearson Education 2005.
- 2. Majumdar S.R., "Oil Hydraulics Systems- Principles and Maintenance", Tata McGraw-Hill, 2001.

REFERENCES:

- 1. Anthony Lal, "Oil hydraulics in the service of industry", Allied publishers, 1982.
- 2. Dudelyt, A. Pease and John T. Pippenger, "Basic Fluid Power", Prentice Hall, 1987.
- 3. Majumdar S.R., "Pneumatic systems Principles and maintenance", Tata McGraw Hill, 1995
- 4. Michael J, Prinches and Ashby J. G, "Power Hydraulics", Prentice Hall, 1989.
- 5. Shanmugasundaram.K, "Hydraulic and Pneumatic controls", Chand & Co, 2006.

HaDiMech

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF MECHANICAL ENGINEERING

Lecture Schedule

Degree/Program: B.E / MECHANICAL

Course code &Name: ME8694-Hydraulics and Pneumatics

Duration: Dec 2020 - Apr 2021 Semester: IV Faculty: Mr. R. Ganesh

AIM:

To expose the students to basics Fluid power systems, Pumps and its Classification, Hydraulic motors, Speed Control system, Pneumatic actuators and CNC Machine tools.

OBJECTIVES:

To impart knowledge on

(i) To provide student with knowledge on the application of fluid power in process, construction and manufacturing Industries.

(ii) To provide students with an understanding of the fluids and components utilized in modern industrial fluid power system.

(iii) To develop a measurable degree of competence in the design, construction and operation of fluid power circuits.

PREREOUISITES: Hydraulics and Pneumatics

COURSE OUTCOMES:

After the course, the student should be able to:

CO	Course Outcomes	POs	PSOs
CO313.1	Explain the Fluid power and operation of different types of pumps	1248	1,2,3
CO313.2	Summarize the features and functions of Hydraulic motors, actuators and Flow control valves	1,2,8	1,2,3
CO313.3	Explain the different types of Hydraulic circuits and systems	1,2,8	1,2,3
CO313.4	Explain the working of different pneumatic circuits and systems	1248	1,2,3
CO313.5	Summarize the various trouble shooting methods and applications of hydraulic and pneumatic systems.	1,2,4,8	1,2,3
CO313.6	Identify and application of Low cost Automation	1,2,4,8	1,2,3

S.No		Period	Topics to be Covered	Book & Page. No.
UNIT	-1 - FLUI	D POWE	ER PRINICIPLES AND HYDRAULIC PUMPS	Target periods :09
1	19.02.21	3	Introduction to Fluid power	Ti
2	22.02.21	4	Advantages and Applications	Ti
3	23.02.21	5	Fluid power systems, Types of fluids	TI
4	24.02.21	7	Properties of fluids and selection, Basics of Hydraulics	71
5	26.02.21	3	Pascal's Law, Principles of flow	TI
6	27.02.21	3	Friction loss - Work, Power and Torque Problems	R2
7	01.03.21	4	Sources of Hydraulic power: Pumping Theory	**************************************
8	02.03.21	5	Pump Classification	R2

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

9	03.03.21	7	Construction, Working, Design, Advantages, Disadvantages	R2
10	05.03.21	3	Performance, Selection criteria of Linear and Rotary	TI
11	06.03.21	4	Fixed and Variable displacement pumps	TI
12		4	Problems	T1
UNI		AULI	C ACTUATORS AND CONTROL COMPONENTS Targ	et periods :0!
13	09.03.21	5	Hydraulic Actuators: Cylinders	T1
14	10.03.21	7	Types and construction, Application, Hydraulic cushioning	T1
15	12.03.21	3	Hydraulic motors	T1
16	13.03.21	5	Control Components: Direction Control,	TI
17	15,03,21	4	Flow control and pressure control valves	R1
18	16.03.21	5	Types, Construction and Operation	R1
19	17.03.21	7	Servo and Proportional valves	R1
20	19.03.21	3	Applications	R1
21	20.03.21	7	Accessories : Reservoirs, Pressure Switches, Applications	T1
22	22.03.21	4	Fluid Power ANSI Symbols	Tl
23	23.03.21	5	Problems.	T1
UNIT	III - HYD	RAULI	IC CIRCUITS AND SYSTEMS Targe	t Periods :09
24	24.03.21	7	Accumulators, Intensifiers, Industrial hydraulic circuits	TI
25	26.03.21	3	Regenerative, Pump Unloading	T1
26	29.03.21	4	Double Pump,	TI
27	30.03.21	5	Pressure Intensifier	T1
28	31.03.21	7	Air-over oil	T1
29	02.04.21	3	Sequence, Reciprocation	T1
30	03.04.21	3	Synchronization, Fail-Safe	TI
31	05.04.21	4	Speed Control	R3
32	06.04.21	5	Hydrostatic transmission	R3
33	07.04.21	7	Electro hydraulic circuits	R3
34	09.04.21	3	Mechanical hydraulic servo systems.	R2
35	10.04.21	4	Problems.	R3
UNIT	IV - PNEU	MATI	C AND ELECTRO PNEUMATIC SYSTEMS Target	Periods :09
36	12.04.21	3	Properties of air - Perfect Gas Laws	T2
37	13.04.21	4	Compressor – Filters	T2
38	14.04.21	5	Regulator, Lubricator, Muffler	T2
39	16.04.21	7	Air control Valves, Quick Exhaust Valves,	T2
40	17.04.21	4	Pneumatic actuators. Design of Pneumatic circuit	T2
41	19.04.21	3	Cascade method	T2
42	20.04.21	4	Electro Pneumatic System	T2
43	21.04.21	5	Elements Ladder diagram	R4
44	23.04.21	7	Problems	R4
45	24.04.21	5	Introduction to fluidics and pneumatic logic circuits	R4
UNIT	V - TROUE	LE SE	HOOTING AND APPLICATIONS Target	Periods:09
46	26.04.21	3	Installation, Selection, Maintenance, Trouble Shooting	T2
47	27.04.21	4	Remedies in Hydraulic and Pneumatic systems,	T2
48	28.04.21	5	Design of hydraulic circuits for Drilling, Planning, Shaping, Surface grinding, Press and Forklift applications	Т2
49	30.04.21	7	Design of Pneumatic circuits for Pick and Place applications and tool handling in CNC Machine tools	Т2
	03.05.21	3	Low cost Automation	T2

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

51	04.05.21	4	Hydraulic and Pneumatic power packs	to too deep and the contract of the contract o
			Content Beyond the Syllabus	R5
52	05.05.21	5	The latest innovations and technology in hydraulics and its scope in future	Material

Book Reference - Text Books

SI.	Title of the Book	Author	Publisher	
1	Fluid Power with		1 donsher	Year
1.	Applications	Anthony Esposito	Pearson Education	2005.
2.	Oil Hydraulics Systems- Principles and Maintenance	Majumdar S.R.	Tata McGraw-Hill,	2001

Book Reference - References

SI	Title of the Book	Author	Publisher	Year	
1.	Oil hydraulics in the service of industry	Anthony Lal	Allied publishers	1982.	
2.	Basic Fluid Power	Dudelyt, A. Pease and John T. Pippenger	Prentice Hall	1987.	
3.	Pneumatic systems – Principles and maintenance	Majumdar S.R.	Tata McGraw Hill	1995	
4	Power Hydraulics	Michael J, Prinches and Ashby J. G	Prentice Hall	1989.	
š	Hydraulic and Pneumatic controls	Shanmugasundaram.K,	Chand & Co	2006.	

Website Reference:

https://archive.nptel.ac.in/courses/112/106/112106300/

https://www.sciencedirect.com/book/9780080966748/hydraulics-and-pneumatics

of the Faculty in-charge

Dr. G. Balakrishnan, M.E., Ph.D.,

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF MECHANICAL ENGINEERING

Assignment Question Paper

Minimum property lightheisteric l	Assignment – 0	l .	Date of Issue:	03.02.2020	Marks	10
Course code	A AND CASE AND ADDRESS OF THE PARTY OF THE P		Hydraulics and Pneumatics		i, see - newson's gift	
Year	III	Semester/Section	VI/A	Date of Submiss	ion: 07.02.	2020

Q.No	Questions	CO
1	Explain the working Principle of hydraulic press with neat sketch	C313.1
2	Explain with a neat sketch the construction & working principle of Gerotor pump.	C313.1

Indra Ganesan College of Engineering
Madural Main Road
Madural Main Road
Manikandam, Trichy-620 012.
Manikandam, Trichy-620 012.

Name and Signature of the Faculty Incharge

Hop/Mech

IG Valley, Manikandam, Tiruchirappalli, Tamii Nadu - 622 012, India (Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

Internal Assessment Test Answer Book

Name	Kanthick.			Year/ Semester	D/jv
Reg No.	8112/6/14/015	Date/Session	26/2/21 - FN	Department	Mest.
Course code	ME 8694	Course Title	Hydraulia	and Preum	general
Internal Assessment Test IAT 1			IAT 2	IAT3	. Model
Name and Sig	enature of the Invig	ilator with date	(APA	42412/4 G.P.	ARUL.

		Part B / Part C						Part A	
Total Marks	b		а	1		School Hess-rea		1	
	Marks		Marks	Ī	Q. NO.	Marks		Q. No.	
10			10		11	<u>"</u>	V	1	
9			9		12	2	~	2	
7	,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,,		7		13	2	2	3	
					14	2_	2	4	
					15	1	2	5	
					16	2	~	6	
26	Total				2	~	7		
Signature ner with date		0		Grand T		1	v	8	
			100	ر	44	2	r	9	
74 fe/51	R.Goa. R.Garest		100	/	50	2.	w	10	

		To be fil	led by the	examiner			T m . I
Course Outcomes	1	2	3	4	5	6	Total
Marks allotted		50					5.
Marks Obtained		44					d Signature
	· ·	C Audit - Re				of the IQ	AC member

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IC Velloy Maduraj Main Romi

26 012.

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu - 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF MECHANICAL ENGINEERING

Proof of Conduct of Content Beyond Syllabus(CBS)

Name of the Faculty: Mr.R.Ganesh Degree & Program: B.E. /Mechanical Course Code & Name: ME8694-Hydraulics & Pneumatics

Semester: IV Academic Year: 2020 -2021 /EVEN

TOPIC:

THE LATEST INNOVATIONS AND TECHNOLOGY IN HYDRAULICS AND ITS SCOPE IN **FUTURE**

INTRODUCTION:

The development of smart sensing technologies will have an impact on pneumatics in the future. All sorts of fluid power equipment, from connectors, tubing, and hoses to pneumatic cylinders, actuators, and filters, are increasingly included cost-effective sensing and information processing devices.

Hydraulics is a matured industry, but still, it requires improvements to become a part of the digital world. The fact is, current hydraulic industry have several drawbacks. The hydraulic experts are working on these issues for improving energy efficiency, reliability, energy storage, and redeployment capabilities. So, the latest technology in hydraulics will focus on improvements in these areas by reducing the size and environmental hazards. Today, most of the hydraulic systems are used to lift, pick or grasp things. Such systems have a wide range of application in various industries like construction, manufacturing, automobile, medical, etc. But soon the new hydraulic technology will bring advancements to these existing technologies and applications. The latest hydraulics innovations are focusing on renewable energy applications, smart user interfaces, load sensing valve technology, and hybrid actuation systems. Some of the applications of these are mentioned below.

Hybrid actuation systems

Hybrid Actuation System (HAS) is ideal for harsh power generation environments such as those used with solar panels, wind turbines, and hydroelectric dams. HAS can be combined with an integrated Intellinder sensor, that eliminates the complexity of gun drilling and unprotected external sensors. This system improves efficiency without any complex maintenance.

Smart user interfaces

The hydraulic industry is moving forward to create user interface applications. Already, Parker has succeeded in developing a UX Toolkit software tool that simplifies all applications of the machine. This application included core machine functions, smart control systems, diagnostics or prediction applications that decrease downtime, or GPS monitoring and navigation applications. Using Parker's pro display HMI module, the desired features can be centralized into a single display and a uniform user interface.

Load sensing valve technology

EQA (Electric Flow Amplifier) EcoFormance technology bring advancements in load sensing valves by improving the machine control. This technology is used in mining, forest and construction machines. Similarly, IQAN connect is another product by Parker that monitor and control mobile machines.

Expandable SKF Quick grip Bolt

Dr. G. Balakrishnan, M.E., Ph.D., Principal Indra Ganesan College of Engineering IG Valley, Madurai Main Road Manikandam, Trichy-620 012.

These new generation bolts are used to connect two rotating flanges quickly, reliably and easily. These SKF Quickgrip Bolts can be applied to all types of critical applications such as propulsion systems. It eliminates potential slippage and it can transfer both heavy radial and axial loads.

Hydraulic Design Tools

Most of the current generation hydraulic design tools included one-dimensional modeling. But, soon the industry will convert into two dimensional or 3D modeling. This will improve the project quality and resiliency. This technology can locate and illustrate patterns of flow discharge, water surface elevations, depth, velocity, and shear stress. Thus, it provides accurate data for the planning and design team.

• Future of the Hydraulics Industry

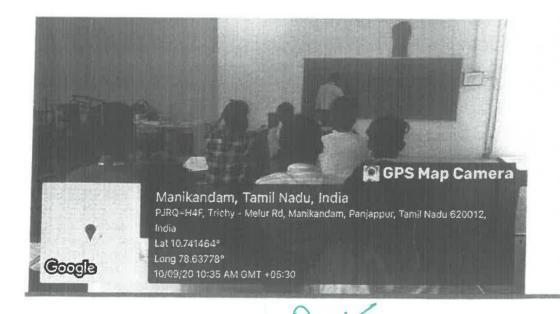
A few years back, hydraulic was considered as a dying industry. Because nobody wanted to become a hydraulic professional due to the danger in that field. But now the situation has changed, this industry will be there in the next century also.

Hydraulics is there from the 17th century onwards. When you consider the applications of hydraulics from the past to the present, the growth of this industry will become clearly visible for you. The early inventions included piston pumps and water clocks and now it has reached on robotics and heavy equipment.

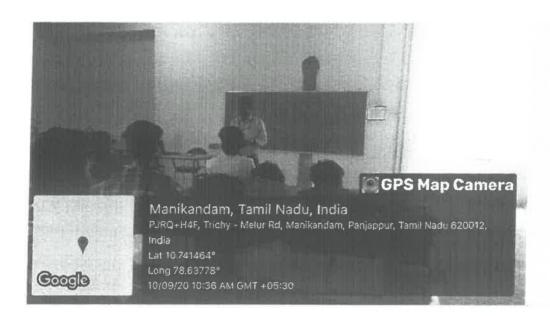
Recently most of the hazardous industrial applications use hydraulic power transmission method. Because electrical sparks will create accidents on potentially combustible atmospheres. Also, the advancements in reactance-based technology will create more vacancies in Hydraulic Job.

Website Referencece:

https://www.linkedin.com/pulse/latest-innovations-technology-hydraulics-its-scope-future-atchison/



Dr. G. Balakrishnan, M.E., Ph.D.,



Signature of the Faculty in-charge

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal nesan College of Er

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu - 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF MECHANICAL ENGINEERING

Identification of Curricular Gap & Content Beyond Syllabus(CBS)

Name of the Faculty: Mr.R.Ganesh

Course Code & Name: ME8694-Hydraulics & Pneumatics

Degree & Program: B.E. /Mechanical

Semester: VI Academic Year: 2020 -2021 /EVEN

I.Mapping of Course Outcomes with POs & PSOs.(before CBS)

Table.1 Mapping of COs. C. PSOs with POs - before CBS

Course	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2	PSO3
CO313.1	3	3	A	2		-	-	1		-	-	-	3	3	2
CO313.2	3	3	•	- 1	-	*	-	1		_	49	_	3	2	2
CO313.3	3	3	and a second second	-	-	-	-	1	-	-	-	_	3	2	2
CO313.4	3	3		2	**	10-		1		-	_	auriticia a-	3	2	2
CO313.5	3	3	-	2	-		-	1	-		-	-	3	2	2
CO313.6	3	3	*	2		*	-	1		_		_ 1	3	2	2
CO313	3	3	891	2	- 1	**		1	-	- 1		-	3	2	3

II. Identification of content beyond syllabus.

Table.2 Identification of content beyond syllabus

Details of Content Beyond Syllabus(CBS) added	POs strengthened/ vacant filled	CO/Unit
The latest innovations and technology in hydraulics and its scope in future	PO4, PO5,PO9(2) Vacant filled	CO313.2 & CO313.3 II & III

III. Mapping of Course Outcomes with POs & PSOs. (After CBS)

Table 3 Mapping of COs. C. PSOs with POs. after CRS

Course	PO1	PO2	PO3	PO4	POS	PO6	PO7	PO8	POO	POIA	DOLL	PO12	DCO1	DCOO	DCO3
2000	101	102	100	10,	105	1 00	107	100	1 03	1010	POLI	POIZ	PSOI	PSU2	PSU3
CO313.1	3	3		2	-			1	-	-		-	3	2	2
CO313.2	3	3	-	*2	*2		-	1	*2	-		-	2	2	2
CO313.3	3	3	-	*2	*2			1	*2	na l	-		2	2	2
CO313.4	3	3	-	2	AND AND	No.	-	1	-	-		-	2	2	2
CO313.5	3	3	-	2	-	- 1	-	1	-	-	-	-	2	2	2
CO313.6	3	3	-	2	-	-	-	1		-	-	_	2	2	2
CO313	3	3	-0	2	2		-	1	2	- 1	-Henry may		2	2 1	2

Signature of the Faculty

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

DEPARTMENT OF MECHANICAL ENGINEERING

Assignment Answer Sheet

Name of the Student: p. Nandha kumar

AU Register Number: 811216114 023

					Marks 10	
	Assignment	t - 01	Date of Issue:	03.02.2020	Viarius 10	
Course code	Course Title			Hydraulics and Pneumatics		
	m	Semester/Section	VI/A	Date of Submission:	07.02.2020	
Year	111	200000000000000000000000000000000000000		A STATE OF STREET STREET, STRE		

	Ouestions Ouestions	CO
Q.No	Questions	
1	Explain the working Principle of hydraulic press with neat sketch	C313.1
	Explain with a neat sketch the construction & working principle of Gerotor pump.	C313.1
2	Explain with a neat sketch die constitution & working principal	

Mark Allocation

Rubrics	Marks Allocated	Marks obtained
Content Quality	6	6
Presentation Quality	2	
Timely submission	2	2
Total marks	10	9

R. CHANGEHANN

Name and Signature of the Faculty Incharge

HoD/Mech

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

Indra Ganesan College of Engineering

IG Valley, Mad not from Ford Meniton, art. restroction as

-	Register Number:	Γ	Г				_
İ	rechisect Huminet.						



IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu – 620 012, India (Approved by AICTE, New Delhi and affiliated to Anna University, Chennai)

	Internal Assessment Ex	am - II - Key Notes	Date	M M	arks	50		
Course o	code ME 8694	Course Title	Hydraulics and Pneumatics					
Regulati	on 2017	Duration	90 minutes	Academic Year	2020-2	1		
Year	Ш	Semester	VI	Department	Mechanical Engg			
COURS	E OUTCOMES			Depai trucut	MICCHA	nicai Engg		
CO1:	Explain the Fluid power	er and operation of differen	t types of number		-			
CO2:	Summarize the feature	s and functions of Hydrauli	c motors actuators and	Flory commel	The sales	****		
CO3:	Explain the different ty	pes of Hydraulic circuits as	nd systems	Flow control varves.				
CO4:	Explain the working of	different pneumatic circuit	s and system			***************************************		
CO5:	Summarize the various	trouble shooting methods a	and applications of hude	ardia and annual and				
CO6:	Explain the application	s of Hydraulic and Pneum	atic systems	aune and pheumane syste	ms.			

Q.No.	Question	CO	ВТ
	PART A		L/ X
1	(Answer all the Questions $10 \times 2 = 20 \text{ Marks}$)		
•	What is the function of pump in hydraulic system? Ans:	CO313.2	K.
	In a hydraulic system, a pump converts mechanical energy into hydraulic energy.	1	
2	Mechanical energy is given to the pump via a prime mover such as an electric motor.		
4	What is the purpose of baffle plate in a fluid reservoir?	.CO313.2	KI
	The baffle plate is provided between the pump's inlet and return lines for preventing		
	the continuous recirculation of the same fluid into the system.		
	So the foreign particles from the returning fluid are allowed to settle down without any	/	
3	disturbance and the trapped air is allowed to escape.		
5	State the reason why positive displacement pumps found suitable for fluid power application.	CO313.2	Kı
	Ans:		
		del yearlings a	
	Positive displacement pump has minimal internal leakage (slippage) due to which it can		
	sustain the load put on it from the actuator. Hence it found suitable applications in Fluid power engineering.		
4			
•	Distinguish between positive and variable displacement pumps. Ans:	CO313.2	K2
	Viv. 1		
	The state of the s		
	in variable displacement pumps, the	***	
	r p p p p p p p		
	Revolution of pump shaft rotation.		
	2 Ex Cost summa Vanaga E T I I I		
5	2. Ex. Gear pumps, Vane pumps Ex. Unbalanced Vane pump		
Ī	Name two designs of vane pumps? Ans:	CO313.2	K1
	. Unbalanced Vane Pump b. Balanced Vane Pump	†	
11	How can you vary the displacement in an axial piston pump?	CO313.2	K1
	Ans:	1	
1	The variable displacement in an axial piston pump can be achieved by altering the		
įż	ungle of the swash plate.		
9	Because in axial pumps, this swing angle determines the piston stroke and hence the		
11	unip displacement.		
	efine the volumetric efficiency of the pump	CO313.2	KI

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

+ ask Lunchentz. 上きていることを advised to of house to Charles ! ad with a land SAL Novcenhann & Meith Bying Betest Conta ALL THE Sent hi Robert B Lange by frage HELLER PRESE ALECAST TO THE TOTAL TOTAL Medis line Transfelone Kelle wase 4 44 7 Scholen A Sale A 7 9

at air

Dr. G. Balakrishnan, M.E., Ph.D.,

Comment of the second

Ans:			
It indicates the amount of leakage within the pump. This involves considerations manufacturing tolerances and flexing of the pump casing under the design pressur operating conditions.	such as		- 9999 Saddy Library and American
$\eta_{V} = \frac{\text{Actual Flow rate produced by pump}}{\text{Theoretica I flow rate the pump should produce}} \times 100 = \frac{Q_{A}}{Q_{I}}$	Marin williams whee boar		
Theoretical flow rate the pump should produce $\frac{100}{Q_r}$	Arthur		1
o Define the mechanical efficiency of a pump?			
PATIS:		0313.2	
It indicates the amount of energy losses that occur due to reasons other the leakages. This includes friction in bearings and between other mating parts. It is includes energy losses due to fluid turbulence.	han ilso		
Theoretica Power required to operate the pump			
$ \eta_{m} = \frac{\text{Theoretica I Power required to operate the pump}}{\text{Actual power delivered to the pump}} \times 100 = \frac{PQ_{T}}{2\pi NT} $ What are the types of hydraulic peterts as the pump			
types of frydraulic actuators?	CO		
Ans:	CO	313.2	K
Hydraulic Cylinders - Linear motion		1	
rlydraulic Motors - Continuous rotary motion			
Semi rotary Actuators - Limited angle movement	Ī		
What are the advantages of double acting cylinder over single acting cylinder? Ans:	CO3	13.2	KI
	1003	13.2	K.
In a single acting cylinder, the fluid is fed only on one side. Hence the cylinder can	to fine company	***************************************	
	n		
double acting cylinder, so they perform work in both directions.	11		
In a single acting cylinder, the stroke is limited by the compressed length of the spri	ng.		
While the piston moves formed in			
While the piston moves forward in a single acting cylinder, the fluid has overcome the pressure of the spring and house.	to		
overcome the pressure of the spring and hence some power is lost before the actual stroke of the piston starts. But this problem.	ne		
actual stroke of the piston starts. But this problem is not present in a doub acting cylinder.	le		
PART B			
A moreover all 4h. And		en one of making and	
The state of the s	COMM	0	
and an animages of positive displacement name?	CO313	.2	K2
5 marks		- 1	
Description & formulae – 5 marks			
A gear pump has 75 mm outside diameter 50			
A gear pump has 75 mm outside diameter, 50mm inside diameter and 25mm width. If the volumetric efficiency is 95 % at rated pressure what is the actual flow rate? N=1200 rpm.	CO313.	2 k	(2
Ans:			
Diagram – 5 marks		1	1000
Description & formulae – 5 marks			and the same of
	400		
Enumerate the working principles of balanced vane pump with neat sketch. Also write the advantages and disadvantages?	CO313.2	TV.	-
Para disantalitakesi	00313.2	K	4
Ans:			
Diagram — 5 marks			
Description & formulae – 5 marks		-	-
	1		
Explain the working of a still in	1		
Explain the working of a radial piston pump with a neat sketch. Also write an expression for the theoretical displacement per revolution of the crank?	CO313.2	K2	

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal

in the facility of the second	Ans: Diagram – 5 marks Description & formulae – 5 marks		
	PART C (Answer all the Questions 1 x 10 = 10 Marks)		-
13a	A rotary vane air motor has a displacement volume of 80 cm³/rev and operates at 1750rpm using 700 kPa gauge pressure air. Calculate the standard ml/min rate of consumption and kW power output of the motor. Assume the temperature remains constant? Ans: Diagram — 5 marks Description & formulae – 5 marks	CO313.2	K2
-	OR	ny andre de la companya de la compan	-
13b	If a hydraulic circuit has pump inlet and exit ports interchanged, unloading valve given internal pilot. What happens? Explain. Ans:	CO313.2	K2
	Diagram – 5 marks Description & formulae – 5 marks	7772	

(Name /Sign / Date)

(Name /Sign / Date)

Dr. G. Balakrishnan, M.E., Ph.D., Principal



Indra Ganesan College of Engineering
Madurai Main Road(NH-45B), Manikandam, Tiruchirappalli-620012
Approved by AICTE, New Delhi, Affiliated to Anna University,
ChennaiNAAC Accredited, 2(F)&12(B)StatusInstitutionbyUGC



IGCE/EXAMCELL/IA/2020-21/Even/UT/006 **RE MODEL EXAM-I**

Test Time: (AN)2,00 pm to 5,00 pm

DATE	YEAR/	22.03.202	1 23.03.202	1 24.03.202	25.03.202	1 26.03.202	27.63.207
BRANCH	SESSION	AN	AN	AN	AN	AN	AN
	D.	CE8401	CE8402	MA8491	CE8491	CE8404	CE8403
CIVIL	111	CE8601	CE8602	CE8603	CE8604	EN8592	CE8005
	TV :	GE8076		CE8022			
	14	CS8491	CS8493	CS8451	CS8494	MA8402	CS8492
CSE	113	CS8603	CS8691	CS8601	CS8602	CS8651	CS8075
	iv	GE8076	tadeides/04/deideides/	CS8080			
	T.	EE8401	EE8451	MA8491	EE8402	IC8451	EE8403
EEE	MI	EE8601	EE8691	EE8602	EE8661	EE8002	EE8005
	rv.	EE8015	n in the same of t	EE8018			
	9	EC8491	MA8451	EC8451	GE8291	EC8453	EC8452
ECE	III	MG8591	EC8691	EC8004	EC8652	EC8095	EC8651
	10	EC8072		EC8094			
	H	ME8493	ME8491	ME8492	MA8452	ME8451	CE8395
MECH	m	ME8651	ME8691	ME8091	ME8693	ME8694	ME8692
	30	MG8591		ME8094			***************************************
	H	CS8491	CS8493	CS8451	GE8291	MA8391	CS8492
IT		CS8091	CS8592	IT8601	IT8076	CS8092	IT8602
	FV.	GE8076	-	IT8078			





Copy To:

- 1. The Director for favor of kind information
- 2. The Principal (file copy)
- 3. All HoDs :request to circulate among their faculty members
- 4. Exam cell file
- 5. Notice Board (Lab Block)

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal



IG Valley, Manikandam, Tiruchirappatli, Tamil Nadu - 620 012, India (Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25)

IQA	CA	cade	mie	Auc	lit F	orm
Sprach Street Street Street Street	- The state of the			And and and		

Nar	ne of Depa	riment :	ACADEMI MECH Y	C YEAR:20 car / Sem:)20-202) H					legistered :	48
Det	ads of Exa	mination :	1A Test-2								, 0
S.No	Course Code		List of Reg No Verified	Course Log Book Verified (Y / N)	Course file Verfied	No of Students	Ke of Abstrates	No of Failures	Pess		Remarks
	ME 8694	8112	811216114001		y	48	3 -	12	75		
		8112	811216114002		4			- Approx		- 42	
	Y days to the second and the second	8112	16114003	8 4	4	4 6					
4		81/21	811216114004		Y	5v					iriga empilikanganga nigungga s nagang
5		8112	8112/6/14005		4				T de la companya de l		Adjusting age grades may many
8		8112	16114006	Y	4	3					
7		8112	Lahlm1-	Y	Y						
8		8112	1611408	4	4						
9		81121	6114009	7	4	21	4				
10		81121	6114010	, 4	4						
N		81121	6114011	, 7	7						

Dr. G. Balakrishnan, M.E., Ph.D.,

1 12		811216114012	У		4			The state of the s	The state of the s	Walterstein
13		811216114013	4	1,	7				-	·
14		811216114014	4	4			-tentrig.		and the state of t	da da an whiteau y
15		811216114015	4	······································				+	-	
16		81121614016	4	4			ł			- pa-4
17	(a Red	811216114017	4	4			+	i i		
18		81121614018	4	4	The same		10.5	-		
19	***	811216114019	Ý	4	1 12	1				
20		811216114020	4	u	. 9	1				
21		811216114021	4	4						
22		811216114022	4	4	ļa,					
23		81121614023	7	4			.			
4		811216114024	Y							
Š		81121614025	Y	4		¥,				
i		811216/14026	4	4						
		811216114027	7	40						

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Maduret Main Road
Mandandam, Trichy-620 017

28	81/2/6/14028	1	7	
	812/6/14029	7	4	
30	81216114030	Y	4	
31	81216114031	y	4	
32	8/12/6/14032	Y	4	
77	8112 16114033	y	y	
34	8112 16114024	Y	Y	
25	818 16114035	Y	4	
36	81216114036	Y	7	
37	81216114037	7	7	
38	811216114301	4	4	
38	811216114302	Y	7	
40	811216114304	7	7	
4	811216114305	Y	Y	
42	811216114701	4	7	
43	811216114702	Y	Y	

Dr. G. Balakrishnan, M.E., Ph.D.,
Principal
Indra Ganesan College of Engineering
IG Valley, Madurai Main Road
Manikandam, Trichy-620 012.







IGCE/EXAMCELL/IA/2020-21/Even/UT/001

INTERNAL ASSESSMENT TEST

DATE	Time: (FN)	14-1-1-1	to 1.00 pm		(AN) 3.3	30 pm to 5.0	00 pm
BRANCH	SESSION		AN	FN	AN	FN	AN
	II	CE8401	CE8402	MA8491	CE8491	CE8404	CE840
CIVIL	THE	CE8601	CE8602	CE8603	CE8604	EN8592	CE800
	IV	GE8076		CE8022			
	y y	CS8491	CS8493	CS8451	CS8494	MA8402	CS849
CSE	10	~~~~~		CS8601	CS8602	CS8651	CS8075
	TV	GE8076		CS8080			
	N.	EE8401	EE8451	MA8491	EE8402	IC8451	EE8403
EEE	TID .	EE8601	EE8691	EE8602	EE8661	EE8002	EE8005
	IV	EE8015	22	EE8018			
	H H	EC8491	MA8451	EC8451	GE8291	EC8453	EC8452
ECE	Iti	MG8591	EC8691	EC8004	EC8652	EC8095	EC8651
	TV.	EC8072	The control of the co	EC8094	100		- Divinoga
	n	ME8493	ME8491	ME8492	MA8452	ME8451	CE8395
MECH	THE	ME8651	ME8691	ME8091	ME8693	ME8694	ME8692
	14	MG8591		ME8094		**************************************	**************************************
	3.0	CS8491	CS8493	CS8451	GE8291	MA8391	CS8492
IT	m	CS8091	CS8592	IT8601	IT8076	CS8092	IT8602
100	45	GE8076		IT8078			- 1400 Jay

ORDINATOR

PRINCIPAL

COPY TO:

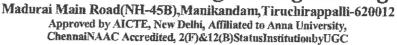
- 1. The Director for favour of kind information
- 2. The Principal (file copy)
- 3. All HoDs :request to circulate among their faculty members
- 4. Exam cell file
- 5. Notice Board (Lab Block)

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal



Indra Ganesan College of Engineering





IGCE/EXAMCELL/IA/2020-21/Even/UT/003 INTERNAL ASSESSMENT TEST - II

Test Time: (FN) 11.30 am to 1.00 pm - (AN) 3.30 pm to 5.00 pm

	Time: (FN)			**	(AN) 3.3	0 pm to 5.0t	3 pm
DATE	YEAR	18	.02.2021	19	.02.2821	20	.02.2021
BRANCH	SESSION	FN	AN	EN	AN	FN	AN
		CE8401	CE8402	MA8491	CE8491	CE8404	CE840:
CIVIL	10	CE8601	CE8602	CE8603	CE8604	EN8592	CE800:
	14 C	GE8076		CE8022			1
	4	CS8491	CS8493	CS8451	CS8494	MA8402	CS8492
CSE	in	CS8603	CS8691	CS8601	CS8602	CS8651	CS8075
	N.	GE8076		CS8080			
	No.	EE8401	EE8451	MA8491	EE8402	IC8451	EE8403
EEE	100	EE8601	EE8691	EE8602	EE8661	EE8002	EE8005
	TV	EE8015	13 F-77 T-1 Variable	EE8018		The second secon	
	u	EC8491	MA8451	EC8451	GE8291	EC8453	EC8452
ECE	cor	MG8591	EC8691	EC8004	EC8652	EC8095	EC8651
	£V.	EC8072		EC8094			2 CE806 CE849 CS807: EE840 EE8009 CE8395 ME8692
		ME8493	ME8491	ME8492	MA8452	ME8451	CE8395
MECH	10	ME8651	ME8691	ME8091	ME8693	ME8694	ME8692
	14	MG8591		ME8094		?	-
	11	CS8491	CS8493	CS8451	GE8291	MA8391	CS8492
IT	313	CS8091	CS8592	IT8601	IT8076	CS8092	IT8602
	PIV	GE8076	***************************************	IT8078			

EXAM CELL CO ORDINATOR

PRINCIPAL

COPY TO:

- 1. The Director for favor of kind information
- 2. The Principal (file copy)
- 3. All HoDs :request to circulate among their faculty members
- 4. Exam cell file
- 5. Notice Board (Lab Block)

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal



Indra Ganesan College of Engineering
Madurai Main Road(NH-45B), Manikandam, Tiruchirappalli-620012
Approved by AICTE, New Delhi, Affiliated to Anna University,
ChennaiNAAC Accredited, 2(F)&12(B)StatusInstitutionbyUGC



IGCE/EXAMCELL/IA/2020-21/Even/UT/005 **MODEL EXAM-I**

Test Time: (AN)2.00 pm to 5.00 pm

DATE	YEAR!	08.03.202	1 09.03.202	19.03.202	1 11.03.202	1 12.03.202	13.03.202
BRANCH	SESSION	AN	AN	AN	AN	AN	AN
	10	CE8401	CE8402	MA8491	CE8491	CE8404	CE8403
CIVIL	期	CE8601	CE8602	CE8603	CE8604	EN8592	CE8005
	(V	GE8076		CE8022			
	11	CS8491	CS8493	CS8451	CS8494	MA8402	CS8492
CSE	m	CS8603	CS8691	CS8601	CS8602	CS8651	CS8075
	iv	GE8076		CS8080		- Minimum co	
	lane /	EE8401	EE8451	MA8491	EE8402	IC8451	EE8403
EEE	121	EE8601	EE8691	EE8602	EE8661	EE8002	EE8005
	tv	EE8015		EE8018	**************************************		3444
	П	EC8491	MA8451	EC8451	GE8291	EC8453	EC8452
ECE	Ш	MG8591	EC8691	EC8004	EC8652	EC8095	EC8651
	SV.	EC8072		EC8094			
	11	ME8493	ME8491	ME8492	MA8452	ME8451	CE8395
MECH	m	ME8651	ME8691	ME8091	ME8693	ME8694	ME8692
	n	MG8591		ME8094			11110072
	1	CS8491	CS8493	CS8451	GE8291	MA8391	CS8492
IT	100	CS8091	CS8592	IT8601	IT8076	CS8092	IT8602
	12/	GE8076		IT8078			11000E

COORDINATOR

PRINCIPAL

Copy To:

The Director for favor of kind information
 The Principal (file copy)
 All HoDs :request to circulate among their faculty members

4. Exam cell file

5. Notice Board (Lab Block)

man, M.E., Ph.D.,

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennai-25) IG Valley, Manikandam, Tiruchirappalli, Tamil Nadu - 620 012, India

DEPARTMENT OF MECHANICAL ENGINEERING

ROOT CAUSE ANALYSIS

Name of the Faculty: Mr. R. Ganash Degree & Program: B.E. Mackeni

am : B.E. Maclowich : IA Tot - 2

IA Test

.. 95.

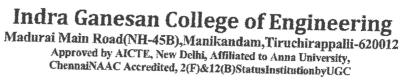
Course Code & Name: ME 8684- Hydraulic 38 Premtis

University Exam/Month & Year: May | June 2020

ROLLNO	2	2.	۳.	00	5.	12		8.
NAME OF THE STUDENT	Amar Praven. D	Annuda Perund. P Health & Suns	chinneppan. A	Dinash Baby M	Gunascalan. 9	Manyam. S	Kinthikan, P	Mahandra
CAUSES FOR FAILURE	Health Pssus	Health 135ms	A Mathisius	Attended Attended	Health Essua	Attender fruit	Maalth 135wa	Masth Bus
CORRECTIVE ACTION TAKEN	Retest tordun	99	9.9	66	99	33	66	
PREVENTIVE ACTION TAKEN	Health Essus Rotest Conduity of duises to	29	66	at history	a duises to take its	advised to	adviscet to party	Da Salahishnan MK Phil

Indra Ganesan College of Engineeri IG Valley, Madurai Main Re Manikandam, Trichy-620 012.







IGCE/EXAMCELL/IA/2020-21/Even/UT/002 INTERNAL ASSESSMENT RETEST - I

Test Time: (FN) 11.30 am to 1.00 pm

DATE	rime: (FN)	The Real Property lies and the last lies and the	5.01.2021		(AN) 3.3	30 pm to 5.00 pm		
	YEAR!		3.01.2021		6.01.2021	0'	7.01.2021	
BRANCH	SESSION	FN	AN	FN	AN	FN	AN	
	THE REAL PROPERTY.	CE8401	CE8402	MA8491	CE8491	CE8404	CE840	
CIVIL		CE8601	CE8602	CE8603	CE8604	EN8592	CE800:	
	TV	GE8076		CE8022			***************************************	
		CS8491	CS8493	CS8451	CS8494	MA8402	CS8492	
CSE	EEE	CS8603	CS8691	CS8601	CS8602	CS8651	CS8075	
	P	GE8076		CS8080				
A PROPERTY	9	EE8401	EE8451	MA8491	EE8402	IC8451	EE8403	
DEE	ш	EE8601	EE8691	EE8602	EE8661	EE8002	EE8005	
	IV	EE8015		EE8018	4			
	13	EC8491	MA8451	EC8451	GE8291	EC8453	EC8452	
ECE	EEG	MG8591	EC8691	EC8004	EC8652	EC8095	EC8651	
	10	EC8072		EC8094				
		ME8493	ME8491	ME8492	MA8452	ME8451	CE8395	
MECH	in	ME8651	ME8691	ME8091	ME8693	ME8694	ME8692	
辨断 。	3V	MG8591		ME8094				
	TY .	CS8491	CS8493	CS8451	GE8291	MA8391	CS8492	
IT	m	CS8091	CS8592	IT8601	IT8076	CS8092	IT8602	
	35	GE8076		IT8078			_ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~ ~	





COPY TO:

- 1. The Director for favour of kind information
- 2. The Principal (file copy)
- 3. All HoDs :request to circulate among their faculty members
- 4. Exam cell file
- 5. Notice Board (Lab Block)

Dr. G. Balakrishnan, M.E., Ph.L.,

Principal





Indra Ganesan College of Engineering
Madurai Main Road(NH-45B), Manikandam, Tiruchirappalli-620012
Approved by AICTE, New Delhi, Affiliated to Anna University, ChennaiNAAC Accredited, 2(F)&12(B)StatusInstitutionbyUGC

IGCE/EXAMCELL/IA/2020-21/Even/UT/004 INTERNAL ASSESSMENT RETEST - II

Test Time: (FN) 11.30 am to 1.00 pm (AN) 3.30 pm to 5.00 pm

DATE	nine. (riv) .	The second secon	02.2021	The second secon	(A/Y) 5.30	<i>) pm to 5.0</i> 0	02-2021
BRANCH	SESSION	FN	AN	FN	IAN	FN	AN
	in in	CE8401	CE8402	MA8491	CE8491	CE8404	CE840.
CIVIL	118	CE8601	CE8602	CE8603	CE8604	EN8592	CE800:
	TV IV	GE8076		CE8022	7		
	11	CS8491	CS8493	CS8451	CS8494	MA8402	CS8492
CSE	1112	CS8603	CS8691	CS8601	CS8602	CS8651	CS8075
	IV.	GE8076	**Composition of the state of t	CS8080			
	11	EE8401	EE8451	MA8491	EE8402	IC8451.	EE8403
EEE	m	EE8601	EE8691	EE8602	EE8661	EE8002	EE8005
	īv	EE8015		EE8018			
		EC8491	MA8451	EC8451	GE8291	EC8453	EC8452
ECE	10	MG8591	EC8691	EC8004	EC8652	EC8095	EC8651
	. IV	EC8072	of the second of	EC8094			
	II .	ME8493	ME8491	ME8492	MA8452	ME8451	CE8395
MECH	711	ME8651	ME8691	ME8091	ME8693	ME8694	ME8692
	TY.	MG8591		ME8094			
	H	CS8491	CS8493	CS8451	GE8291	MA8391	CS8492
rr	T int	CS8091	CS8592	IT8601	IT8076	CS8092	IT8602
	įv	GE8076		TT8078			





COPY TO:

- 1. The Director for favor of kind information
- 2. The Principal (file copy)
- 3. All HoDs :request to circulate among their faculty members
- 4. Exam cell file
- 5. Notice Board (Lab Block)

Dr. G. Balakrishnan, M.E., Ph.D.,

Principal

(Approved by AICTE, New Delhi, Affiliated to Anna University, Chennal-25) IG Valley, Manikandam, Tiruchirappalli, Tamii Nadu - 620 012, India INDRA GANESAN COLLEGE OF ENGINEERING

Percentage Principal sge tigisW latoT chanosi SEMESTER Colostatias 10N Choiselshas DD. 02. Somewhat *beamatico* mo 300 Y1012Bleite? STUDENT FEEDBACK ON FACULTY contro poog 17 THEORY COURSE Faculty Name R Asii. Cooq Regoraulics 202 [A / [I] l Excellent 10 2020 is the teacher distributing answer scripts of students as Is the teacher addressing grievances on answer scripts Delivery of Lectures by Interactive Communication ACADEMIC YEAR: Year / Sem: is the teacher completing syllabus as per lecture Is the teacher covering content beyond syllabus 06800 Level of Preparedness & Knowledge Level Involventent in mentoring and guiding MECH is the teacher punctual to class? Use of Teaching Aids and ICT Effective Time management SNOLLSHOOM of IA while distributing? per schedule? Name of Department: Subject Code & Name schedule? 5 m -4 5 90 o, ý. ON'S

Dr. G. Balakrishnan, M.E., Ph.D.,

10AC Co-ordinator

HoD/ MECHANICAL

INDRA GANESA COLLEGE OF ENGINEERING INDRA GANESAN COLLEGE OF ENGINEERING



IG Valley, Manikandam, Tiruchirappalli, Tamil Madu – 620 012, India (Approved by AICTE, New Delbi, Affiliated to Anna University, Chennai-25)

THEORY COURSE STUDENT FEEDBACK ON FACULTY

N).	Stanibro-o	TOYCC	HOD MECHANICAL	
					V	Is the teacher punchas to class?	.0
han de rallanda harryjarytaglje			1		V	Is the teacher covering content beyond syllabus (CBS)?	.6
p of the state of]		/	Is the teacher addressing grievances on answer scripts of IA while distributing?	.8
May a wholester				V	1	Is the teacher distributing answer scripts of students as per schedule?	٦.
		and the same and t		1		Is the teacher completing syllabus as per lecture schedule?	-9
مهاجه			-	1.7		Effective Time management	۶.
	and the state of t					Involvement in mentoring and guiding	` t
mpanaudia , physi		·				Level of Proparedness & Knowledge Level	3.
		The translation of the secondary expension		V		Use of Teaching Aids and ICT	2
	-			<u> </u>	~	Delivery of Lectures by Interactive Communication	I
0		Z	3	7	g		Ť
Not Satisfactory	Somewhat Satisfactory	Satisfactory	gond	Very Good	Excellent	ASS.	S.Ha.
'Usob.	(Inpqu	. 2 34	Shde	DUO	omerud Granna	Spect Code & Name ME 8694 - Mych	ane
saubin.	HA. E	y Name AESTER	-	1/1/11	Ų.	me of Department: MECH Year/Sem: ACADEMIC YEAR.	

Dr. G. Balakrishman, M.E., Ph.D.,

Inqisning