COURSE FILE CONTENT

1. Vision and Mission statements of the Institute and Department.
2. PEOs, PSOs and PO statements.
3. VTU, College and Department Calendar.
4. Time Table. (Department and Individual time table)
5. Syllabus copy
6. COs, CO-PO and CO-PSO Mapping and Justification.
7. Students List (Students Attendance Register).
8. Course Plan
9. Course Execution Summary
10. Course Assessment and Evaluation scheme.
11. Assignment Questions-I, II, III
12. Internal Assessment Test –I, II, III (Question Papers)
13. Internal Assessment Test – I, II, III – Scheme of Evaluation.
14. Internal Assessment Test I, II, III Performance Analysis.
15. Remedial and Tutorial Classes information (If any)
16. Final Internal (IA) - CIE and External –SEE Marks.
17. VTU Question papers.
18. Course Exit Survey.
19. Course Self Assessment Report.
20. Final Result Analysis
21. Direct and Indirect Attainment of COs, POs and PSOs.
22. CO Attainment Gap Analysis.
23. Action taken report (ATR) on Gap Analysis.
24. Content beyond syllabus.
25. Instructor report (Innovative Practices)
26. Any other related documents.

VISION AND MISSION OF THE INSTITUTE AND DEPARTMENT

VISION OF THE INSTITUTION

To Produce Professionally Excellent, Knowledgeable, Globally Competitive and Socially Responsible Engineers and Entrepreneurs.

MISSION OF THE INSTITUTION

M1	To Provide Quality Education in Engineering and Management.
M2	To Establish a Continuous Industry-Institute Interaction, Participation and Collaboration to Contribute Skilled Engineers.
M3	To Develop Human Values, Social Values, Entrepreneurship Skills and Professional Ethics among the Technocrats.
M4	To Focus on Innovation and Development of Technologies by Engaging in Cutting Edge Research areas.

VISION OF THE DEPARTMENT

To Produce Professionally Excellent, Knowledgeable, Globally Competitive, Socially Responsible Mechanical Engineers and Entrepreneurs.

MISSION OF THE DEPARTMENT

M1	To provide quality education in Mechanical Engineering and Management.
M2	To establish a continuous industry - institute interaction, participation and collaboration to contribute skilled Mechanical Engineers.
M3	To develop human values, socio-ethical values, entrepreneur skills and professional ethics among Mechanical Engineers.
M4	To focus on Research & Development (R & D) and Innovative Technologies by engaging in cutting edge research areas of Mechanical Engineering.

PROGRAM EDUCATIONAL OBJECTIVES (PEO'S)

PEO1	Graduates of Mechanical Engineering shall Develop Strong Academic Foundation for Successful Professional Career
PEO2	Graduates of Mechanical Engineering Acquires skills to excel in the area of Mechanical Engineering both in Industries and Academics
PEO3	Graduates of Mechanical Engineering Possess awareness towards Higher Education, R & D and Socio-Ethical values

PROGRAM SPECIFIC OUTCOMES (PSO)

PSO 1	Graduates are able to Design, Analyze and Develop Mechanical Systems.
PSO 2	Graduates are Capable of Developing Research Skills in Self Sustainable Energy sources and Composite Materials.

PROGRAM OUTCOMES (PO)

PO 1	**Engineering Knowledge**	Apply the knowledge of mathematics, science, engineering fundamentals, and an engineering specialization to the solution of complex engineering problems.
PO 2	**Problem Analysis**	Identify, formulate, review research literature, and analyze complex engineering problems reaching substantiated conclusions using first principles of mathematics, natural sciences, and engineering sciences.
PO 3	**Design/ Development of Solutions**	Design solutions for complex engineering problems and design system components or processes that meet the specified needs with appropriate consideration for the public health and safety, and the cultural, societal, and environmental considerations.
PO 4	**Conduct investigations of complex problems**	Use research-based knowledge and research methods including design of experiments, analysis and interpretation of data, and synthesis of the information to provide valid conclusions.
PO 5	**Modern tool usage**	Create, select, and apply appropriate techniques, resources, and modern engineering and IT tools including prediction and modelling to complex engineering activities with an understanding of the limitations.
PO 6	**The engineer and society**	Apply reasoning informed by the contextual knowledge to assess societal, health, safety, legal and cultural issues and the consequent responsibilities relevant to the professional engineering practice.
PO 7	**Environment and sustainability**	Understand the impact of the professional engineering solutions in societal and environmental contexts, and demonstrate the knowledge of, and need for sustainable development.
PO8	**Ethics**	Apply ethical principles and commit to professional ethics and responsibilities and norms of the engineering practice.
PO 9	**Individual and team work**	Function effectively as an individual, and as a member or leader in diverse teams, and in multidisciplinary settings.
PO 10	**Communication**	Communicate effectively on complex engineering activities with the engineering community and with society at large, such as, being able to comprehend and write effective reports and design documentation, make effective presentations, and give and receive clear instructions.
PO 11	**Project management and finance**	Demonstrate knowledge and understanding of the engineering and management principles and apply these to one's own work, as a member and leader in a team, to manage projects and in multidisciplinary environments.
PO 12	**Life-long learning**	Recognize the need for, and have the preparation and ability to engage in Independent and life-long learning in the broadest context of technological change.

V. V. SANGHA'S

RAO BAHADUR Y MAHABALESHWARAPPA ENGG COLLEGE, BALLARI – 583104.

(Formerly VIJAYANAGARA ENGINEERING COLLEGE)

CANTONMENT, BALLARI-583 104 (KARNATAKA).

DEPARTMENT OF MECHANICAL ENGINEERING

CALENDER OF EVENTS

ACADEMIC YEAR 2020 – 21 (ODD SEMESTER)

Week (Session)	Mon	Tue	Wed	Thu	Fri	Sat	Sun	Institution / Department Events	VTU Events / Holidays
	SEPTEMBER 2020								
1		1	2	3	4	5	6	1st HOD Meeting.	Commencement of III, V,VII Sem
2	7	8	9	10	11	12	13	7th Submission of workload	
3	14	15	16	17	18	19	20	19th parents meet	
4	21	22	23	24	25	26	27		
5	28	29	30						
	OCTOBER 2020								
				1	2	3	4		2nd Mahatma Gandhi Jayanthi
6	5	6	7	8	9	10	11		6th Mahalaya Amavasya.
7	12	13	14	15	16	17	18	17th, 18th & 19th IA Test-I.	
8	19	20	21	22	23	24	25	23th SMS IA Marks & Attendance to Parents	24th Ayudha Pooja 25th Vijaya Dasami
9	26	27	28	29	30	31		28th Assignment-I Submission	19th Eid mild 20th Valmiki Jayanthi
	NOVEMBER 2020								
							1		1st Rajyotsva
10	2	3	4	5	6	7	8	2nd HOD Meeting	
11	9	10	11	12	13	14	15		14th Naraka Chaturdasi, 15th Deepavali
12	16	17	18	19	20	21	22	20th, 21st & 22nd IA Test-II.	
13	23	24	25	26	27	28	29	25th SMS IA Marks & Attendance to parents.	28th Kanakadas Jayanthi.
14	30							30th Assignment –II Submission	
	DECEMBER 2020								
		1	2	3	4	5	6		3rd Kanaka Das Jayanthi
15	7	8	9	10	11	12	13	7th HOD Meeting	
16	14	15	16	17	18	19	20	14th, 15th & 16th IA Test-III	17th all UG & III PG Last Working Day
17	21	22	23	24	25	26	27	21st Submission of Final IA Marks & Attendance.	21st Final CIE marks ready for VTU portal. 25th Chrismas.
18	28	29	30	31					

Head of the Department,
Dept. of Mechanical Engineering.

Head of the Department,
Mechanical Engineering Department.
R.Y.M. Engineering College,
Cantonment, BELLARY-583 104

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

INDIVIDUAL TIME TABLE 2020-21

INDIVIDUAL TIME TABLE 2020-21 ODD SEM			
STAFF NAME: DR G MANJUNATH SWAMY		SUBJECTS: FPS (7^{TH}A), TRIBOLOGY (7^{TH} B)	
DAY	09:30 – 10.30 AM	11.30 – 12.30 AM	02.30 – 3.3. PM
MON	FPS		
TUE		TRIBOLOGY	
WED	FPS		
THU			TRIBOLOGY
FRI		FPS	
SAT	TRIBOLOGY		

SYLLABUS COPY 2020-21

FLUID POWER SYSTEMS

Module 1 Introduction to fluid power systems

Fluid power system: components, advantages and applications. Transmission of power at static and dynamic states. Pascal's law and its applications.Fluids for hydraulic system: types, properties, and selection. Additives, effect of temperature and pressure on hydraulic fluid. Seals, sealing materials,compatibility of seal with fluids. Types of pipes, hoses, and quick acting couplings. Pressure drop in hoses/pipes. Fluid conditioning through filters, strainers; sources of contamination and contamination control; heat exchangers.

Module 2 Pumps and actuators

Pumps:Classification of pumps, Pumping theory of positive displacement pumps, construction and working of Gear pumps, Vane pumps, Piston pumps,fixed and variable displacement pumps, Pump performance characteristics, pump selection factors, problems on pumps.Accumulators: Types, selection/ design procedure, applications of accumulators. Types of Intensifiers, Pressure switches /sensor, Temperatureswitches/sensor, Level sensor.Actuators:Classification cylinder and hydraulic motors, Hydraulic cylinders, single and double acting cylinder, mounting arrangements, cushioning, specialtypes of cylinders, problems on cylinders.Construction and working of rotary actuators such as gear, vane, piston motors, and Hydraulic Motor. Theoretical torque, power,flowrate, and hydraulicmotor performance; numerical problems. Symbolic representation of hydraulic actuators (cylinders and motors).

Module 3 Components and hydraulic circuit design

Components:Classification of control valves, Directional Control Valves-symbolic representation, constructional features of poppet, sliding spool, rotary type valves solenoid and pilot operated DCV, shuttle valve, and check valves. Pressure control valves - types, direct operated types and pilot operated types. Flow Control Valves -compensated and non-compensated FCV, needle valve, temperature compensated, pressure compensated, pressure and temperature compensated FCV, symbolic representation. Hydraulic Circuit Design:Control of single and Double -acting hydraulic cylinder, regenerative circuit, pump unloading circuit, double pump hydraulic system, counter balance valve application,hydrauliccylinder sequencing circuits, cylinder synchronizing circuit using different methods, hydraulic circuit for force multiplication;speedcontrol of hydraulic cylinder- metering in, metering out and bleed off circuits.Pilot pressure operated circuits.Hydraulic circuit examples withaccumulator.

Module 4 Pneumatic power systems

Introduction to Pneumatic systems:Pneumatic power system, advantages, limitations, applications, Choice of working medium. Characteristics of compressed air and air compressors. Structure of pneumatic control System, fluid conditioners-dryers and FRL unit. Pneumatic

Actuators: Linear cylinder –types of cylinders, working, end position cushioning, seals, mounting arrangements, and applications. Rotary cylinders- types, construction and application, symbols. Pneumatic Control Valves: DCV such as poppet, spool, suspended seat type slide valve, pressure control valves, flow control valves, types and construction, use of memory valve, Quick exhaust valve, time delay valve, shuttle valve, twin pressure valve, symbols.

Module 5 Pneumatic control circuits Simple Pneumatic Control:

Direct and indirect actuation pneumatic cylinders, speed control of cylinders - supply air throttling and exhaust air throttling. Signal Processing Elements: Use of Logic gates - OR and AND gates in pneumatic applications. Practical examples involving the use of logic gates. Multi- Cylinder Application: Coordinated and sequential motion control, motion and control diagrams. Signal elimination methods, Cascading methodprinciple, Practical application examples (up to two cylinders) using cascading method (using reversing valves). Electro- Pneumatic Control: Principles - signal input and output, pilot assisted solenoid control of directional control valves, use of relay and contactors. Control circuitry for simple signal cylinder application.

TEXT BOOKS:

1. Anthony Esposito, "Fluid Power with applications", Pearson edition,2000 .
2. Majumdar S.R., "Oil Hydraulics",TalaMcGRawHllL, 2002 .
3. Majumdar S.R., "Pneumatic systems - Principles and Maintenance",Tata McGraw-Hill, New Delhi, 2005

REFERENCE BOOKS:

1. John Pippenger, Tyler Hicks, "Industrial Hydraulics", McGraw Hill International Edition, 1980.
2. Andrew Par, Hydraulics and pneumatics, Jaico Publishing House, 2005.
3. FESTO, Fundamentals of Pneumatics,VolI,IIandIII.
4. Herbert E. Merritt, "Hydraulic Control Systems", John Wiley and Sons, Inc.
5. Thomson, Introduction to Fluid power, PrentcieHaIl, 2004
6. John Watton, "Fundamentals of fluid power control", Cambridge University press, 2012

COs, CO-PO MAPPING AND JUSTIFICATION 2020-21

CO's	DESCRIPTION
17C402.1	Identify and analyse the functional requirements of a fluid power transmission system for a given application.
17C402.2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function.
17C402.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electro-hydraulics, electro-pneumatics for a given application.
17C402.4	Select and size the different components of the circuit.
17C402.5	Develop a comprehensive circuit diagram by integrating the components selected for the given application.

CO-PO/PSO MAPPING

CO	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11	PO12	PSO1	PSO2
17C402.1	2	2		2	2			2				2	2	
17C402.2	2	2	2	2	2			2				2	2	
17C402.3	3	2	3	2	2			2				2	3	
17C402.4	2	2		2	2			2				2	2	
17C402.5	2	2	2	2	2			2				2	2	
Average	2.2	2	2.3	2	2			2				2	2.2	

*Note: - 1.Slight (Low) 2.Modarate (Medium) 3.Substantial (High).

JUSTIFICATION FOR THE CO WITH THE PO (1-12)

PO1: The contents of the course needs to apply the knowledge of basic engineering fundamentals, Science and mathematics topics, which are studied in lower semesters, hence all CO1, CO2, CO4, CO5 are mapped with correlation 2 and CO3 is mapped with correlation 3.

PO2: Using the concepts of mathematics, science and engineering students can able to identify, formulate and analyze the problems associated with different metal forming processes, Hence all COs are mapped with correlation 2.

PO3: The content of the course does not involve in design and development of solutions, hence CO's 2, 3 & 5 are mapped with correlation 2.

PO4: The content of this subject address PO4. Hence all the CO's are mapped correlation 2.

PO5: According to the course content (syllabus) of the modules uses modern tools, Hence all the CO's are mapped correlation 2.

PO6: The content of this subject doesn't address Social and health issues. Hence none of the CO's is mapped.

PO7: The content of this subject doesn't address Environmental and Sustainability. Hence none of the CO's is mapped.

PO8: Though the content of the course doesn't address Ethical issues directly, students should adopt wherever it is applicable. Hence all CO's are mapped with correlation 2.

PO9: As the course content does not have activities oriented tasks to involve as a Team and work together. Therefore, none of the CO's is mapped.

PO10: Communication is not much addressed by the contents of this syllabus. Therefore, none of the CO's is mapped with PO10.

PO11: The contents of this subject don't address Project management and finance. Hence none of the CO's is mapped.

PO12: As a Mechanical Engineer the basic knowledge of this course content is required in his career development, hence all the CO's are mapped with Correlation 2.

CO-PSO MAPPING MATRIX

PSO's / CO's	PSO1	PSO2
17C402.1	2	
17C402.2	2	
17C402.3	3	
17C402.4	2	
17C402.5	2	
Average	2.2	

*Note: - 1.Slight (Low) 2.Modarate (Medium) 3.Substanial (High).

JUSTIFICATION FOR THE CO WITH THE PSO (1-2)

PSO1: The course content does not have the in depth content where Students are able to design, analyze and develop mechanical system satisfactorily. Hence all the CO's are mapped with PSO1 Correlation 2 & correlation with 3.

PSO2: With the knowledge of this course content students can be able to develop research skill in composite materials. Hence none of the CO's is mapped to PSO2.

STUDENTS LIST

Sl.No	USN	NAME	Sl.No	USN	NAME
A-1	3VC16ME007	ABHISHEK SINHA	A-31	3VC17ME043	MOHAN E
A-2	3VC17ME001	AJAY REDDY N	A-32	3VC17ME046	NAVEEN S
A-3	3VC17ME002	AKASHA GOUDA H	A-33	3VC17ME049	PAVAN KUMAR B
A-4	3VC17ME003	ANIL KITTUR	A-34	3VC17ME054	PAVITHRA R
A-5	3VC17ME004	BHARATHISHA A B	A-35	3VC17ME081	VINAY KUMAR S
A-6	3VC17ME005	BHARGHAV R	A-36	3VC17ME425	S MUSHTAQ
A-7	3VC17ME006	C ESHWAR	A-37	3VC18ME401	ANAND K R
A-8	3VC17ME007	DEEPAK PATIL S R	A-38	3VC18ME402	ANIL KUMAR V
A-9	3VC17ME008	DODDA BASAVA B	A-39	3VC18ME411	H M UDAY KUMAR
A-10	3VC17ME009	DURJAYA K B	A-40	3VC18ME413	IMRAN ABDUL W
A-11	3VC17ME010	EARESH VARMA C	A-41	3VC18ME415	K VINAY KUMAR
A-12	3VC17ME012	ERANAGOUDA K M	A-42	3VC18ME418	KIRAN KUMAR D
A-13	3VC17ME014	G RANJITH	A-43	3VC18ME420	KUMAR K
A-14	3VC17ME016	G S SREE HARSHA	A-44	3VC18ME423	MADHUSUDHAN B
A-15	3VC17ME018	GANESH GOWDA M	A-45	3VC18ME424	MAHANTESH H M
A-16	3VC17ME019	GANESH J	A-46	3VC18ME425	MANIKANTA K
A-17	3VC17ME020	GURUSIDDANA GOUDA B	A-47	3VC18ME431	MULLA ALTAF
A-18	3VC17ME021	HAMPANNA	A-48	3VC18ME433	NISAR AHAMED K M
A-19	3VC17ME022	HANUMESH	A-49	3VC18ME434	G PAVAN KALYAN
A-20	3VC17ME023	J M ABDUL KHADER	A-50	3VC18ME435	PAVITHRA K
A-21	3VC17ME024	JAGADEESH	A-51	3VC18ME441	SAGAR MP
A-22	3VC17ME025	JEFFREY SUJAN KUMAR K	A-52	3VC18ME443	SAMPATH KUMAR
A-23	3VC17ME027	K M PARIKSHITH	A-53	3VC18ME444	SANTOSH G
A-24	3VC17ME028	KAISARAHMED D	A-54	3VC18ME446	K SHIVA KUMAR
A-25	3VC17ME029	KARTHIK KUMAR D	A-55	3VC18ME449	SHIVA SHANKAR A
A-26	3VC17ME030	KARTHIK R B	A-56	3VC18ME454	THIPPESWAMY B
A-27	3VC17ME031	KIRAN MATH	A-57	3VC18ME455	THIPPESWAMY R
A-28	3VC17ME032	LOKESHA NAIK	A-58	3VC18ME457	V SIDDHI VINAY
A-29	3VC17ME033	M CHAITANYA	A-59	3VC18ME459	VINOD KUMAR B
A-30	3VC17ME041	MOHAMMED AZAM J	A-60	3VC18ME460	VISHWANATH H

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

COURSE PLAN 2020-21 (Odd Sem)

Staff Name: Dr. G Manjunath Swamy	Course Type: Core	Sem / Sec: 7th A
Course Name: Fluid Power System	Course Code: 17ME72	Total No. of Lecture Hours: 50
Max marks: 60	Prerequisites: Hydraulics, Mechatronics & Actuators.	

Sl.No	Module Name	Hours Required	Assessment Strategy
01	Introduction to fluid power systems	10 Hrs	CIE , SEE
02	Pumps and actuators	10 Hrs	CIE , SEE
03	Components and hydraulic circuit design	10 Hrs	CIE , SEE
04	Pneumatic power systems	10 Hrs	CIE , SEE
05	Pneumatic control circuits Simple Pneumatic Control	10 Hrs	CIE , SEE

Assessment Strategy:

Assignment	CIE	SEE	Seminar
Mention if any other required:			

Teaching and Learning Tools: Blackboard/PowerPoint presentation.

TEXT BOOKS:

1. Anthony Esposito, "Fluid Power with applications", Pearson edition,2000 .
2. Majumdar S.R., "Oil Hydraulics",TalaMcGRawHIlL, 2002 .
3. Majumdar S.R., "Pneumatic systems - Principles and Maintenance",Tata McGraw-Hill, New Delhi, 2005

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1. John Pippenger, Tyler Hicks, "Industrial Hydraulics", McGraw Hill International Edition, 1980.
2. Andrew Par, Hydraulics and pneumatics, Jaico Publishing House, 2005.
3. FESTO, Fundamentals of Pneumatics, VolI, IIandIII.
4. Herbert E. Merritt, "Hydraulic Control Systems", John Wiley and Sons, Inc.
5. Thomson, Introduction to Fluid power, PrentcieHall, 2004
6. John Watton, "Fundamentals of fluid power control", Cambridge University press, 2012

Digital Library:

1. **\\192.168.8.4\gdlc1\Mechanical Reference Books**
2. **\\192.168.8.4\gdlc1\EngineeringLibrary-1**

Contents beyond Syllabus:

Note: Planning of syllabus to be covered as per units given in VTU syllabus

Staff Signature

HOD

Head of the Department,
Mechanical Engineering Department,
R.Y.M. Engineering Collage,
Cantonment, BELLARY-583 104.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

COURSE EXECUTION SUMMARY 2020-21

Staff Name: Dr. G Manjunath Swamy	Course Type: Core	Sem / Sec: 7th A
Course Name: Fluid Power System	Course Code: 17ME72	Total No. of Lecture Hours: 50
Max marks: 60	Prerequisites: Hydraulics, Mechatronics & Actuators.	

Sl. No.	Date	Time/Period	Topic covered	Remarks
01	02/09/2020	9.30-10.30	Fluid power system: components, advantages and applications.	
02	04/09/2020	9.30-10.30	Transmission of power at static and dynamic states. Pascal's law and its applications.	
03	07/09/2020	11.30-12.30	Fluids for hydraulic system: types, properties, and selection.	
04	09/09/2020	9.30-10.30	Additives, effect of temperature and pressure on hydraulic fluid.	
05	11/09/2020	9.30-10.30	Seals, sealing materials, compatibility of seal with fluids.	
06	14/09/2020	11.30-12.30	Types of pipes, hoses, and quick acting couplings.	
07	16/09/2020	9.30-10.30	Pressure drop in hoses/pipes.	
08	18/09/2020	9.30-10.30	Fluid conditioning through filters, strainers.	
09	21/09/2020	11.30-12.30	Sources of contamination and contamination control.	
10	23/09/2020	9.30-10.30	Heat exchangers.	
11	25/09/2020	9.30-10.30	Pumps: Classification of pumps.	
12	28/09/2020	11.30-12.30	Pumping theory of positive displacement pumps.	
13	30/09/2020	9.30-10.30	Construction and working of Gear pumps.	
14	05/10/2020	9.30-10.30	Vane pumps, Piston pumps, fixed and variable displacement pumps.	
15	07/10/2020	11.30-12.30	Pump performance characteristics, pump selection factors.	
16	09/10/2020	9.30-10.30	Problems on pumps. Accumulators: Types, selection/ design.	
17	12/10/2020	9.30-10.30	Procedure, applications of accumulators. Types of Intensifiers, Pressure switches /sensor.	
18	14/10/2020	11.30-12.30	Temperature switches/sensor, Level sensor. Actuators:	
19	21/10/2020	9.30-10.30	Classification cylinder and hydraulic motors, Hydraulic cylinders.	
20	26/10/2020	9.30-10.30	single and double acting cylinder, mounting arrangements, cushioning, special types of cylinders.	
21	30/10/2020	11.30-12.30	Problems on cylinders. Construction and working of rotary actuators such as gear, vane, piston motors, and Hydraulic Motor.	
22	04/11/2020	9.30-10.30	Theoretical torque, power, flow rate, and hydraulic motor performance; numerical problems.	
23	06/11/2020	9.30-10.30	Symbolic representation of hydraulic actuators (cylinders and motors).	
24	09/11/2020	11.30-12.30	Components: Classification of control valves.	
25	11/11/2020	9.30-10.30	Directional Control Valves-symbolic representation, constructional features of poppet, sliding spool, rotary type valves solenoid and pilot operated DCV,	
26	13/11/2020	9.30-10.30	Shuttle valve, and check valves. Pressure control valves - types, direct operated types and pilot operated types.	
27	16/11/2020	11.30-12.30	Flow Control Valves -compensated and non-compensated FCV, needle valve, temperature compensated, pressure compensated, pressure and temperature compensated FCV.	
28	18/11/2020	9.30-10.30	Symbolic representation. Hydraulic Circuit Design: Control of single and Double -acting hydraulic cylinder.	
29	23/11/2020	9.30-10.30	regenerative circuit, pump unloading circuit, double pump hydraulic system, counter balance valve	
30	25/11/2020	11.30-12.30	Application, hydraulic cylinder sequencing circuits, cylinder synchronizing circuit using different methods, hydraulic circuit for	

			force multiplication; speed control of hydraulic cylinder- metering in, metering out and bleeds off circuits.	
31	27/11/2020	9.30-10.30	Pilot pressure operated circuits. Hydraulic circuit examples with accumulator.	
32	30/11/2020	9.30-10.30	Introduction to Pneumatic systems: Pneumatic power system, advantages, limitations, applications	
33	01/12/2020	11.30-12.30	Choice of working medium. Characteristics of compressed air and air compressors.	
34	02/12/2020	9.30-10.30	Structure of pneumatic control System, fluid conditioners-dryers and FRL unit. Pneumatic Actuators: Linear cylinder –types of cylinders.	
35	04/12/2020	9.30-10.30	Working, end position cushioning, seals, mounting arrangements, and applications.	
36	05/12/2020	11.30-12.30	Rotary cylinders- types, construction and application, symbols. Pneumatic Control Valves:	
37	08/12/2020	9.30-10.30	DCV such as poppet, spool, suspended seat type slide valve, pressure control valves.	
38	09/12/2020	9.30-10.30	flow control valves, types and construction.	
39	11/12/2020	11.30-12.30	use of memory valve, Quick exhaust valve, time delay valve.	
40	12/12/2020	9.30-10.30	Shuttle valve, twin pressure valve, symbols.	
41	17/12/2020	9.30-10.30	Direct and indirect actuation pneumatic cylinders, speed control of cylinders - supply air throttling and exhaust air throttling.	
42	18/12/2020	11.30-12.30	Signal Processing Elements: Use of Logic gates - OR and AND gates in pneumatic applications	
43	19/12/2020	9.30-10.30	Practical examples involving the use of logic gates. Multi- Cylinder Application	
44	21/12/2020	9.30-10.30	: Coordinated and sequential motion control, motion and control diagrams.	
45	23/12/2020	11.30-12.30	Signal elimination methods, Cascading method principle,	
46	26/12/2020	9.30-10.30	Practical application examples (up to two cylinders) using cascading method (using reversing valves).	
47	28/12/2020	9.30-10.30	Electro- Pneumatic Control: Principles - signal input and output,	
48	29/12/2020	11.30-12.30	pilot assisted solenoid control of directional control valves,	
49	30/12/2020	9.30-10.30	Use of relay and contactors.	
50	30/12/2020	11.30-12.30	Control circuitry for simple signal cylinder application.	

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

COURSE EVALUATION AND ASSESSMENT SCHEME-2017

	What		To Whom	When/ Where (Frequency in the course)	Max Marks	Evidence Collected
Direct Assessment Methods	CIE	Continuous Internal Evaluation	Students	Thrice(Average of the best two will be computed)	15	Blue Books
		Assignment		One(During Semester)	05	Assignment Books
		Practical Assessment		Once	20	Practical evaluation
	SEE	Semester Final Examination		End of Course (Answering One of two questions from five Modules)	80	Result sheet
		Practical Examination		One question from lot	80	Result sheet
Indirect Assessment Methods	Students Feedback		Students	End of the course	-	Questionnaire
	Course Exit Survey					

Questions for CIE and SEE will be designed to evaluate the various educational components (Bloom's taxonomy)

ASSIGNMENT -I (2020-21 Odd Sem)

1. Discuss any 6 properties of an ideal hydraulic fluid.
2. Explain the additives used in hydraulic fluid.
3. With a neat block diagram explain structure of a hydraulic control system.
4. Explain the Beta ratio efficiency with an example.
5. Sketch & explain the construction and working of external gear pump.
6. List different types of filters. Explain any one.
7. Sketch & explain the construction and working of vane pump.
8. Sketch & explain the construction and working of internal gear pump.
9. Sketch and explain the construction and working of pressure compensated vane pump.
10. Explain Regenerative circuit.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

CONTINUOUS INTERNAL EVALUATION-I (2020-21 Odd Sem)

Course: Fluid Power Systems	Course Code: 17ME72	Sem: 7th / A-sec
Date: 17/10/2020	Time: 10.00-11.30 AM	Max marks: 50
Course offered by : Dr G Manjunath Swamy		

NOTE: Answer any FIVE questions from the following

Q No	QUESTIONS	Marks	BTL	CO
Q1	With a neat block diagram explain structure of a hydraulic control system.	10	L2	CO1
Q2	or List the properties of hydraulic fluid. Briefly explain it.		L2	CO1
Q3	What is a seal? Classify it.	10	L1	CO1
Q4	or Define filter? Classify different types of filter.		L1	CO1
Q5	With a neat sketch explain the working of external gear pump.	10	L2	CO2
Q6	Or Sketch and explain the construction and working of pressure compensated vane pump.		L2	CO2
Q7	Sketch & explain the construction and working of internal gear pump.	10	L2	CO2
Q8	Or Sketch and explain the construction and working of pressure compensated vane pump.		L2	CO2
Q9	Explain Regenerative circuit.	10	L2	CO2
Q10	or Explain the Beta ratio efficiency with an example.		L2	CO2

Note: BTL (Blooms Taxonomy Level) CO (Course Outcome)

Staff QP Coordinator Course Coordinator HOD

COURSE COMMITTEE CC MECH RYMEC

Head of the Department
Mechanical Engineering Department
R.Y.M. Engineering College,
Cantonment BELLARY-583 104

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

SCHEME OF EVALUATION FOR CIE-I (2020-21 Odd Sem)

Course: Fluid Power Systems	Course Code: 17ME72	Sem: 7th / A-sec
Date: 17/10/2020	Time: 10.00-11.30 AM	Max marks: 50
Course offered by : Dr G Manjunath Swamy		

Q No	SCHEME OF EVALUATION	Marks	BTL	CO
01	Definition of hydraulic control system. Sketch Explanation	02 04 04	L2	CO1
02	List of properties Explanation	05 05	L2	CO1
03	Definition Classification	03 07	L1	CO1
04	Definition Classification	03 07	L2	CO1
05	Sketch Explanation	05 05	L2	CO2
06	Sketch of working of pressure compensated vane pump. Explanation	05 05	L2	CO2
07	Sketch Explanation	05 05	L2	CO2
08	Sketch Explanation	05 05	L2	CO2
09	Sketch of Regenerative circuit. Explanation	05 05	L2	CO2
10	Beta ratio efficiency concept Explanation with an example	05 05	L2	CO2

Note: BTL (Blooms Taxonomy Level) CO (Course Outcome)

Staff QP Coordinator Course Coordinator HOD

COURSE COMMITTEE CC MECH RYMEC

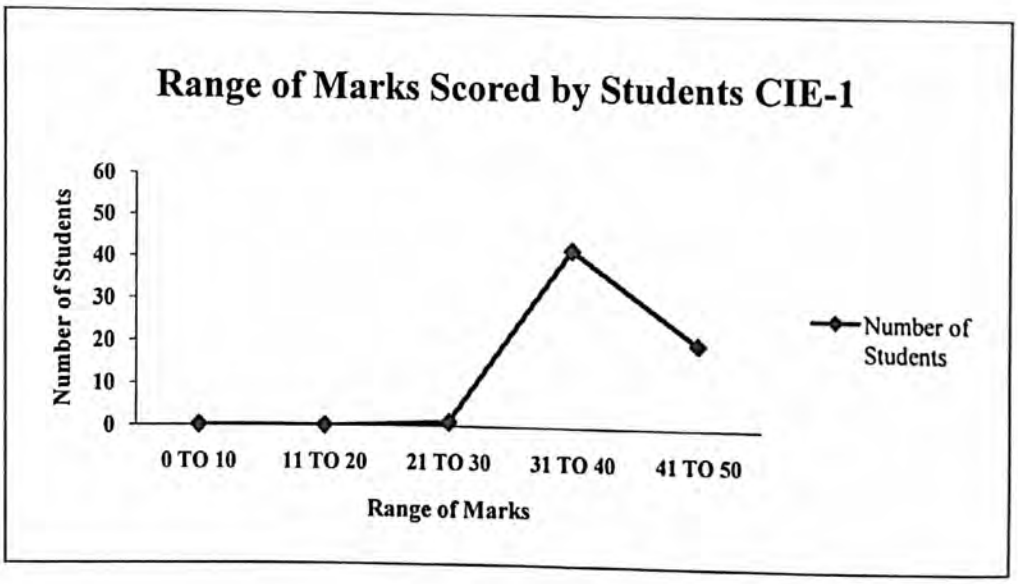
Head of the Department, Mechanical Engineering Department

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

CIE-I PERFORMANCE ANALYSIS

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
CO mapping	17c402.1	17c402.1	17c402.1	17c402.1	17c402.1	17c402.2	17c402.2	17c402.2	17c402.2	17c402.2
Max Marks /Question	10	10	10	10	10	10	10	10	10	10
Total marks of class /question	289	0	216	120	125	72	114	38	176	76
No. of students attended	54	0	54	27	36	18	21	19	35	19
No of students scored > 60% of marks/Question	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Percentage of students scored > 60% of marks/Question	54	0	54	20	17	18	17	0	35	19

Mark range	0 TO 10	11 TO 20	21 TO 30	31 TO 40	41 TO 50
No. Of Students	0	0	1	42	20



ASSIGNMENT -II (2020-21 Odd Sem)

1. What do you mean by hydraulic cylinder? Differentiate b/w single and double acting cylinder.
2. What is a vane motor? Differentiate balanced and unbalanced vane motor.
3. With a neat sketch explain regenerative hydraulic cylinder.
4. With a neat sketch explain meter in & meter out type of control system.
5. What do you mean by a motor? With a neat sketch explain external gear motor.
6. Explain with a neat sketch flow control valve.
7. With a neat sketch explain compensated and non-compensated FCV.
8. List the different Characteristics of compressed air.
9. With a neat sketch explain Structure of pneumatic control System
10. With a neat sketch explain Quick exhaust valve.

ASSIGNMENT -II (2020-21 Odd Sem)

1. What do you mean by hydraulic cylinder? Differentiate b/w single and double acting cylinder.
2. What is a vane motor? Differentiate balanced and unbalanced vane motor.
3. With a neat sketch explain regenerative hydraulic cylinder.
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8. List the different Characteristics of compressed air.
9. With a neat sketch explain Structure of pneumatic control System
10. With a neat sketch explain Quick exhaust valve.

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Department of Mechanical Engineering

CONTINUOUS INTERNAL EVALUATION- II (2020-21 Odd Sem)

Course: Fluid Power Systems	Course Code: 17ME72	Sem: 7th / A-sec
Date: 02/12/2020	Time: 02.30-04.00 PM	Max marks: 50
Course offered by : Dr G Manjunath Swamy		

NOTE: Answer any FIVE questions from the following

Q No	QUESTIONS	Marks	BTL	CO
Q1	What do you mean by hydraulic cylinder? Differentiate b/w single and double acting cylinder.	10	L2	CO3
Q2	or Explain with a neat sketch flow control valve.		L2	CO3
Q3	With a neat sketch explain regenerative hydraulic cylinder.	10	L2	CO3
Q4	or With a neat sketch explain meter in & meter out type of control system.		L2	CO3
Q5	What do you mean by a motor? With a neat sketch explain external gear motor.	10	L2	CO3
Q6	or With a neat sketch explain compensated and non-compensated FCV.		L2	CO3
Q7	List the different Characteristics of compressed air.	10	L2	CO4
Q8	or What is a vane motor? Differentiate balanced and unbalanced vane motor.		L2	CO4
Q9	With a neat sketch explain Structure of pneumatic control System	10	L2	CO4
Q10	or With a neat sketch explain Quick exhaust valve.		L2	CO4

Note: BTL (Blooms Taxonomy Level) CO (Course Outcome)

Staff QP Coordinator Course Coordinator HOD

COURSE COMMITTEE CC MECH RYMEC

Head of the Department,
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Cantonment, BELLARY-583 104

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

SCHEME OF EVALUATION FOR CIE-II (2020-21 Odd Sem)

Staff Name: Dr G Manjunath Swamy	Sem: VII	Sec: A
Subject Name: Fluid Power Systems	Subject Code: 17ME72	
Date: 02-12-2020, Time : 02.30-04.00 PM	Max Marks: 5*6=30	

NOTE: Answer any FIVE questions from the following

Q No	SCHEME OF EVALUATION	Marks	BTL	CO
01	Definition of hydraulic cylinder Sketch of hydraulic cylinder Differentiation	02 04 04	L2	CO3
02	List Explanation	05 05	L2	CO3
03	Definition of regenerative hydraulic cylinder. Classification of regenerative hydraulic cylinder.	03 07	L2	CO3
04	Definition Classification	03 07	L2	CO3
05	Sketch Explanation	05 05	L2	CO3
06	Sketch of compensated and non-compensated FCV. Explanation of compensated and non-compensated FCV.	05 05	L2	CO3
07	List of compressed air Characteristics of compressed air	05 05	L2	CO4
08	Sketch Explanation	05 05	L2	CO4
09	Sketch of Structure of pneumatic control System Explanation of Structure of pneumatic control System	05 05	L2	CO4
10	Sketch Explanation	05 05	L2	CO4

Note: BTL (Blooms Taxonomy Level) CO (Course Outcome)

Staff | QP Coordinator | Course Coordinator | HOD

CC MECH RYMEC

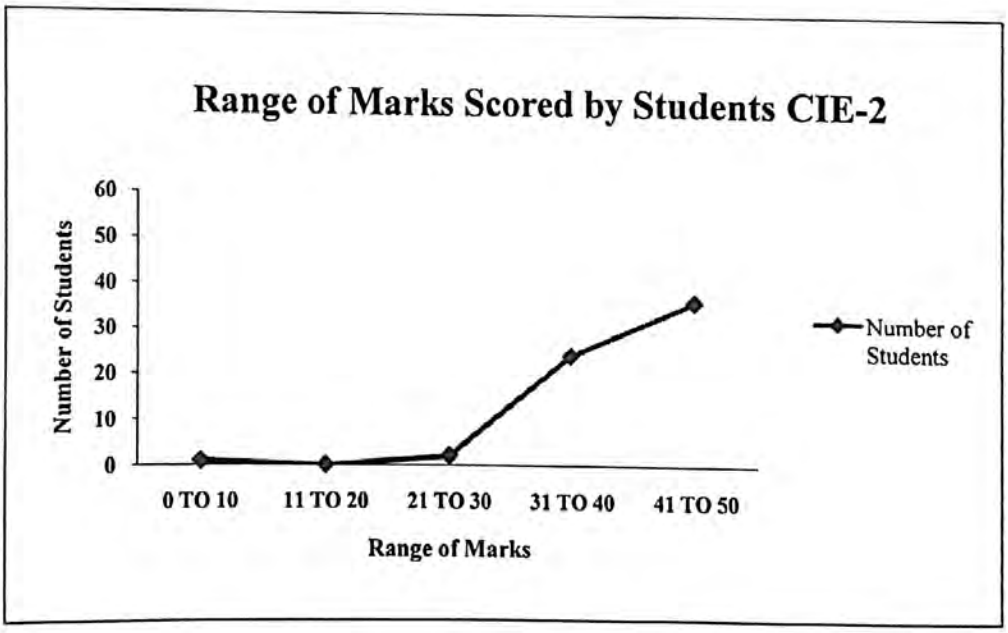
Head of the Department, Mechanical Engineering Department

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

CIE-II PERFORMANCE ANALYSIS

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
CO mapping	17c403.3	17c403.3	17c403.3	17c403.3	17c403.3	17c403.3	17c403.3	17c403.3	17c403.3	17c403.3
Max Marks /Question	10	10	10	10	10	10	10	10	10	10
Total marks of class /question	139	164	271	8	57	41	29	207	155	73
No. of students attended	27	33	58	2	11	34	7	49	33	23
No of students scored > 60% of marks/Question	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Percentage of students scored > 60% of marks/Question	26	33	50	1	10	1	5	35	32	9

Mark range	0 TO 10	11 TO 20	21 TO 30	31 TO 40	41 TO 50
No. Of Students	1	0	2	24	36



ASSIGNMENT -III (2020-21 Odd Sem)

1. Explain the characteristics of compressed air.
2. Sketch and explain different types of Rodless cylinder.
3. Sketch and explain structure of hydraulic pneumatic control system.
4. What is cylinder mounting? List different types.
5. Design a circuit for pressure controlled reversal of a double action single cylinder using switches.
6. Design a sequencing circuit for double acting pneumatic cylinders using logic gates.
7. Explain OR & AND logic functions in pneumatic control system.
8. Explain the graphical representation of motion diagram.
9. Explain the cascade method in pneumatic control system.
10. Explain different process control requirements.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

CONTINUOUS INTERNAL EVALUATION-III (2020-21 Odd Sem)

Course: Fluid power systems	Course Code: 17ME72	Sem: 7th / A-sec
Date: 05/01/2021	Time: 02.00-03.30 PM	Max marks: 50
Course offered by : Dr G Manjunath Swamy		

NOTE: Answer any FIVE questions from the following

Q No	QUESTIONS	Marks	BTL	CO
Q1	Explain the characteristics of compressed air. or	10	L2	CO4
Q2	Sketch and explain different types of Rodless cylinder.		L2	CO4
Q3	Sketch and explain structure of hydraulic pneumatic control system. or	10	L2	CO4
Q4	With a neat sketch explain Quick exhaust valve.		L2	CO4
Q5	What is cylinder mounting? List different types. or	10	L2	CO5
Q6	Design a sequencing circuit for double acting pneumatic cylinders using logic gates.		L2	CO5
Q7	Explain different process control requirements. or	10	L2	CO5
Q8	Explain OR & AND logic functions in pneumatic control system.		L2	CO5
Q9	Explain the cascade method in pneumatic control system. or	10	L2	CO5
Q10	Explain the graphical representation of motion diagram.		L2	CO5

Note: BTL (Blooms Taxonomy Level) CO (Course Outcome)

Staff QP Coordinator Course Coordinator HOD

COURSE COMMITTEE CC MECH RYMEC

Head of the Department, Mechanical Engineering Department R.Y.M. Engineering College, Cantonment, BELLARY

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

SCHEME OF EVALUATION FOR CIE-III (2020-21 ODD Sem)

Course: Fluid power systems	Course Code: 17ME72	Sem: 7th / A-sec
Date: 05/01/2021	Time: 02.00-03.30 PM	Max marks: 50
Course offered by : Dr G Manjunath Swamy		

NOTE: Answer any FIVE questions from the following

Q No	SCHEME OF EVALUATION	Marks	BTL	CO
01	Characteristics & properties of compressed air Explanation	02 04 04	L2	CO4
02	Sketch of Rodless cylinder. Different types of Rodless cylinder.	05 05	L2	CO4
03	Definition Classification	03 07	L2	CO4
04	Definition Classification	03 07	L2	CO4
05	Sketch of cylinder mounting Explanation & types cylinder mounting	05 05	L2	CO5
06	Sketch Explanation	05 05	L2	CO5
07	Sketch Explanation	05 05	L2	CO5
08	Sketch of OR & AND logic functions in pneumatic control system. Explanation of OR & AND logic functions in pneumatic control system.	05 05	L2	CO5
09	Sketch Explanation	05 05	L2	CO5
10	Sketch of graphical representation of motion diagram. Explanation of graphical representation of motion diagram.	05 05	L2	CO5

Note: BTL (Blooms Taxonomy Level) CO (Course Outcome)

Staff QP Coordinator Course Coordinator HOD

COURSE COMMITTEE CC MECH RYMEC

Head of the Department, Mechanical Engineering Department

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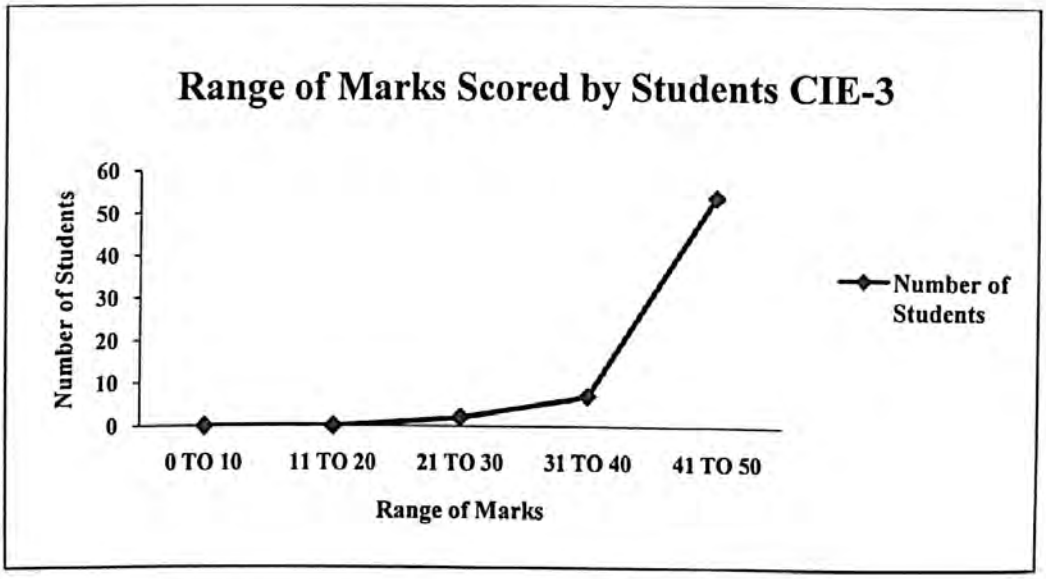
Department of Mechanical Engineering

CIE-III PERFORMANCE ANALYSIS

	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10
CO mapping	17C402.4	17C402.4	17C402.4	17C402.4	17C402.4	17C402.4	17C402.5	17C402.5	17C402.5	17C402.5
Max Marks /Question	10	10	10	10	10	10	10	10	10	10
Total marks of class /question	230	52	21	194	205	10	27	92	195	21
No. of students attended	39	9	4	37	43	3	12	18	38	4
No of students scored > 60% of marks/Question	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6	3.6
Percentage of students scored > 60% of marks/Question	39	9	4	34	40	1	1	17	37	4

Mark range	0 TO 10	11 TO 20	21 TO 30	31 TO 40	41 TO 50
No. Of Students	0	0	2	7	54



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Department of Mechanical Engineering

REMEDIAL AND TUTORIAL CLASSES INFORMATION

Sl. No	Topic Covered
01	Rate your proficiency in understanding the introduction to fluid power systems
02	Rate your proficiency in understanding the fluids of hydraulic systems
03	Rate your proficiency in understanding about difference between pumps and actuators.
04	Rate your proficiency in understanding classification of cylinders and hydraulic motors.
05	Rate your proficiency in understanding components of hydraulic circuit.
06	Rate your proficiency in understanding working principle of hydraulic circuit design.
07	Rate your proficiency in understanding introduction to pneumatic systems.
08	Rate your proficiency in understanding signal processing elements.
09	Rate your proficiency in understanding the electro pneumatic applications.
10	Rate your proficiency in understanding the electro pneumatic control concept.

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Cantonment BELLARY-583 104.

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

FINAL CIE AND SEE MARKS

Roll No	USN	Name of the Student	CIE	SEE	Roll No	USN	Name of the Student	CIE	SEE
A-1	3VC16ME007	ABHISHEK SINHA	34	48	A-33	3VC17ME049	PAVAN KUMAR B	34	37
A-2	3VC17ME001	AJAY REDDY N	37	40	A-34	3VC17ME054	PAVITHRA R	36	39
A-3	3VC17ME002	AKASHA GOUDA H	34	45	A-35	3VC17ME081	VINAY KUMAR S	36	46
A-4	3VC17ME003	ANIL KITTUR	35	46	A-36	3VC17ME425	S MUSHTAQ	37	40
A-5	3VC17ME004	BHARATHISHA A B	36	32	A-37	3VC18ME401	ANAND K R	35	42
A-6	3VC17ME005	BHARGHAV R	38	40	A-38	3VC18ME402	ANIL KUMAR V	36	46
A-7	3VC17ME006	C ESHWAR	35	40	A-39	3VC18ME411	H M UDAY KUMAR	37	45
A-8	3VC17ME007	DEEPAK PATIL S R	35	45	A-40	3VC18ME413	IMRAN ABDUL W	36	47
A-9	3VC17ME008	DODDA BASAVA B	37	37	A-41	3VC18ME415	K VINAY KUMAR	36	48
A-10	3VC17ME009	DURJAYA K B	37	33	A-42	3VC18ME418	KIRAN KUMAR D	35	37
A-11	3VC17ME010	EARESH VARMA C	36	39	A-43	3VC18ME420	KUMAR K	36	30
A-12	3VC17ME012	ERANAGOUDA K M	34	32	A-44	3VC18ME423	MADHUSUDHAN	34	35
A-13	3VC17ME014	G RANJITH	36	44	A-45	3VC18ME424	MAHANTESH H M	35	37
A-14	3VC17ME016	G S SREE HARSHA	35	30	A-46	3VC18ME425	MANIKANTA K	37	39
A-15	3VC17ME018	GANESH GOWDA M	35	40	A-47	3VC18ME431	MULLA ALTAF	37	46
A-16	3VC17ME019	GANESH J	36	31	A-48	3VC18ME433	NISAR AHAMED K	35	40
A-17	3VC17ME020	GURUSIDDANA	37	46	A-49	3VC18ME434	G PAVAN KALYAN	35	42
A-18	3VC17ME021	HAMPANNA	36	44	A-50	3VC18ME435	PAVITHRA K	38	46
A-19	3VC17ME022	HANUMESH	35	45	A-51	3VC18ME441	SAGAR MP	36	45
A-20	3VC17ME023	J M ABDUL KHADER B	37	45	A-52	3VC18ME443	SAMPATH KUMAR	36	47
A-21	3VC17ME024	JAGADEESH	36	37	A-53	3VC18ME444	SANTOSH G	34	48
A-22	3VC17ME025	JEFFREY SUJAN	37	39	A-54	3VC18ME446	K SHIVA KUMAR	37	37
A-23	3VC17ME027	K M PARIKSHITH	34	46	A-55	3VC18ME449	SHIVA SHANKAR	34	30
A-24	3VC17ME028	KAISARAHMED D	36	40	A-56	3VC18ME454	THIPPESWAMY	35	35
A-26	3VC17ME030	KARTHIK R B	34	42	A-57	3VC18ME455	THIPPESWAMY	36	37
A-27	3VC17ME031	KIRAN MATH	37	46	A-58	3VC18ME457	V SIDDHI VINAY	38	39
A-28	3VC17ME032	LOKESHA NAIK	34	45	A-59	3VC18ME459	VINOD KUMAR	35	46

A-29	3VC17ME033	M CHAITANYA	35	47	A-60	3VC18ME460	VISHWANATH H	35	40
A-30	3VC17ME041	MD AZAM J	36	48	A-61	3VC18ME461	VISHWANATH K	37	42
A-31	3VC17ME043	MOHAN E	38	37	A-62	3VC18ME462	VYSHNAVI	37	46
A-32	3VC17ME046	NAVEEN S	35	30	A-63	3VC18ME464	YESHWANTH D	36	45

Staff

HOD
Head of the Department,
Mechanical Engineering Department,
B.Y.M. Engineering College,
[illegible] 583 104

VTU QUESTION PAPER

 15ME72

Seventh Semester B.E. Degree Examination, Aug./Sept.2020
Fluid Power Systems

Time: 3 hrs. Max. Marks: 80

Note: Answer any FIVE full questions, choosing ONE full question from each module.

Module-1

1 a. With the help of sketch explain the components of fluid power system. **(08 Marks)**

b. Define Pascal's law and solve the following problem.[Refer Fig.Q1(b)]

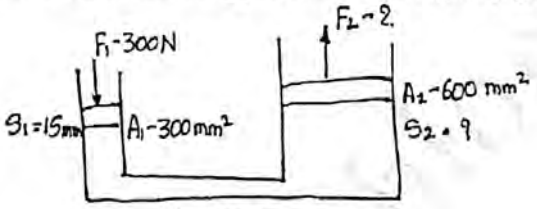

Fig.Q1(b)

Find F_2 and S_2. **(08 Marks)**

OR

2 a. With the help of neat sketch explain
(i) Suction line filter (ii) Pressure line filter. **(06 Marks)**

b. Write a note on the following :
(i) O-Rings **(03 Marks)**
(ii) Piston Cup Rings **(03 Marks)**
(iii) Heat Exchanger. **(04 Marks)**

Module-2

3 a. With the help of neat sketch explain Internal Gear Pump. **(08 Marks)**

b. A hydraulic pump has displacement volume of 90 cm^3 and delivers 82 lpm at 1000 rpm and 7 MPa. If the i/p torque delivered is 102 N-m. Find Volumetric efficiency, Mechanical efficiency, overall efficiency and theoretical torque required to operate the pump. **(08 Marks)**

OR

4 a. With the help of neat sketch explain cushioning of hydraulic cylinders. **(08 Marks)**

b. A hydraulic motor has 100 cm^3 volumetric displacement. If it has a pressure rating of 140 bars and receives oil from a 0.001 m^3/s theoretical flow rate pump. Find
(i) Speed (ii) Theoretical torque (iii) Theoretical power. **(08 Marks)**

Module-3

5 a. With the help of neat sketch explain compound pressure relief valve. **(08 Marks)**

b. With the help of neat circuit explain sequencing of cylinders in a hydraulic system. **(08 Marks)**

OR

6 a. With the help of neat sketch explain 3 position 4 way direction control valve with closed centre configuration. **(08 Marks)**

b. With the help of neat sketch explain application of counter balance valve in a hydraulic system (Counter balance circuit) **(08 Marks)**

Module-4

7 a. What are the advantages , disadvantages and applications of pneumatic system. **(07 Marks)**

b. With the help of neat sketch explain FRL unit. **(09 Marks)**

OR

8 a. With the help of neat sketch explain pneumatic cylinder mounting methods. **(08 Marks)**

b. With the help of neat sketch explain quick exhaust valve. **(08 Marks)**

Module-5

9 a. With the help of neat circuit explain OR gate system. **(08 Marks)**

b. With the help of neat circuit explain coordinated motion control system. **(08 Marks)**

OR

10 a. Explain supply air and air exhaust throttling. **(08 Marks)**

b. With a neat sketch explain solenoid controlled pilot operated direction control valve. **(08 Marks)**

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RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

COURSE EXIT SURVEY

Staff Name: Dr G Manjunath Swamy	**Semester: VII**	**Sec: A**
Course Name: Fluid power systems	**Course Code: 17C402**	**Total contact hours: 50**
Max marks:60	**Prerequisites: Hydraulics, Actuators.**	
Academic year: 2020-21		

Course Code: 17C402	**Course Title: Fluid power systems**
Student Name:	**USN:**
Mobile No.:	**Email ID:**

Dear Student

In your opinion, how will you grade yourself in the attainment of the following Course Outcomes after undergoing **Industrial Safety** course (Please tick (√) in the appropriate column).

Excellent - 5, Very Good - 4, Good - 3, Average - 2, Below Average - 1

Course Outcome		5	4	3	2	1
At the end of the course, students will be able to ….						
17C402.1	Identify and analyse the functional requirements of a fluid power transmission system for a given application.					
17C402.2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function.					
17C402.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electrohydraulics, electro-pneumatics for a given application.					
17C402.4	Select and size the different components of the circuit.					
17C402.5	Develop a comprehensive circuit diagramby integrating the components selected for the given application.					

Signature of Student

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

Rl.No.	USN	Name of the Student	17C 402. 1	17C 402. 2	17C 402. 3	17C 402. 4	17C 402. 5	Sign of the Student
A-1	3VC16ME007	ABHISHEK SINHA	3	4	4	5	5	
A-2	3VC17ME001	AJAY REDDY N	5	5	5	5	5	
A-3	3VC17ME002	AKASHA GOUDA H	5	5	5	5	5	
A-4	3VC17ME003	ANIL KITTUR	5	5	5	5	5	
A-5	3VC17ME004	BHARATHISHA A B	5	5	5	5	5	
A-6	3VC17ME005	BHARGHAV R	4	5	5	5	5	
A-7	3VC17ME006	C ESHWAR	5	5	5	4	5	
A-8	3VC17ME007	DEEPAK PATIL S R	5	5	5	5	5	
A-9	3VC17ME008	DODDA BASAVA B	5	4	5	4	5	
A-10	3VC17ME009	DURJAYA K B	5	4	5	5	4	
A-11	3VC17ME010	EARESH VARMA C	5	5	5	5	5	
A-12	3VC17ME012	ERANAGOUDA K M	5	5	5	4	5	
A-13	3VC17ME014	G RANJITH	5	5	5	5	5	
A-14	3VC17ME016	G S SREE HARSHA	5	5	5	5	5	
A-15	3VC17ME018	GANESH GOWDA M	5	5	4	3	5	
A-16	3VC17ME019	GANESH J	5	5	5	5	5	
A-17	3VC17ME020	GURUSIDDANA	5	5	5	5	5	
A-18	3VC17ME021	HAMPANNA	5	5	5	5	5	
A-19	3VC17ME022	HANUMESH	5	5	5	5	5	
A-20	3VC17ME023	J M ABDUL KHADER B	5	5	5	5	5	
A-21	3VC17ME024	JAGADEESH	5	5	5	5	5	
A-22	3VC17ME025	JEFFREY SUJAN	5	5	5	5	5	
A-23	3VC17ME027	K M PARIKSHITH	5	5	5	5	5	
A-24	3VC17ME028	KAISARAHMED D	5	5	5	5	5	
A-26	3VC17ME030	KARTHIK R B	4	4	4	4	5	
A-27	3VC17ME031	KIRAN MATH	5	5	4	5	5	
A-28	3VC17ME032	LOKESHA NAIK	5	5	5	5	5	
A-29	3VC17ME033	M CHAITANYA	5	5	5	4	4	
A-30	3VC17ME041	MD AZAM J	5	5	5	5	3	
A-31	3VC17ME043	MOHAN E	5	5	5	5	4	
A-32	3VC17ME046	NAVEEN S	5	5	5	5	5	
A-33	3VC17ME049	PAVAN KUMAR B	5	5	4	5	5	
A-34	3VC17ME054	PAVITHRA R	5	5	5	5	3	
A-35	3VC17ME081	VINAY KUMAR S	5	5	5	4	4	
A-36	3VC17ME425	S MUSHTAQ	5	5	5	5	5	
A-37	3VC18ME401	ANAND K R	5	5	4	5	5	
A-38	3VC18ME402	ANIL KUMAR V	5	5	4	5	5	
A-39	3VC18ME411	H M UDAY KUMAR	5	5	5	5	5	
A-40	3VC18ME413	IMRAN ABDUL W	5	5	5	5	5	
A-41	3VC18ME415	K VINAY KUMAR	5	5	5	5	5	
A-42	3VC18ME418	KIRAN KUMAR D	5	5	5	5	5	
A-43	3VC18ME420	KUMAR K	5	5	5	5	5	
A-44	3VC18ME423	MADHUSUDHAN	5	5	5	5	5	
A-45	3VC18ME424	MAHANTESH H M	4	4	4	4	5	
A-46	3VC18ME425	MANIKANTA K	5	5	4	5	4	
A-47	3VC18ME431	MULLA ALTAF	5	5	5	5	5	
A-48	3VC18ME433	NISAR AHAMED K	5	5	5	5	5	
A-49	3VC18ME434	G PAVAN KALYAN	4	4	4	4	5	
A-50	3VC18ME435	PAVITHRA K	5	5	4	5	5	
A-51	3VC18ME441	SAGAR MP	5	5	5	5	5	
A-52	3VC18ME443	SAMPATH KUMAR	5	5	5	4	4	
A-53	3VC18ME444	SANTOSH G	5	5	5	5	3	
A-54	3VC18ME446	K SHIVA KUMAR	5	5	5	5	4	
A-55	3VC18ME449	SHIVA SHANKAR	5	5	5	5	5	
A-56	3VC18ME454	THIPPESWAMY	5	5	4	5	5	
A-57	3VC18ME455	THIPPESWAMY	5	5	5	5	3	
A-58	3VC18ME457	V SIDDHI VINAY	5	5	5	4	4	
A-59	3VC18ME459	VINOD KUMAR	5	5	5	5	5	
A-60	3VC18ME460	VISHWANATH H	5	5	4	5	5	
A-61	3VC18ME461	VISHWANATH K	5	5	4	5	5	
A-62	3VC18ME462	VYSHNAVI	5	5	5	5	5	

A-63	3VC18ME464	YESHWANTH D	5	5	5	5	5	

COURSE SELF ASSESSMENT REPORT

Staff Name: Dr G Manjunath Swamy	**Semester: VII**	**Sec: A**
Course Name: Fluid power systems	**Course Code: 17C402**	**Total contact hours: 50**
Max marks:60		
Academic year: 2020-21		

Sl. No.	Questionnaires	Ratings				
		Excellent (5)	Very Good (4)	Good (3)	Fair (2)	Poor (1)
01	Rate your proficiency in understanding the introduction to fluid power systems					
02	Rate your proficiency in understanding the fluids of hydraulic systems					
03	Rate your proficiency in understanding about difference between pumps and actuators.					
04	Rate your proficiency in understanding classification of cylinders and hydraulic motors.					
05	Rate your proficiency in understanding components of hydraulic circuit.					
06	Rate your proficiency in understanding working principle of hydraulic circuit design.					
07	Rate your proficiency in understanding introduction to pneumatic systems.					
08	Rate your proficiency in understanding signal processing elements.					
09	Rate your proficiency in understanding the electro pneumatic applications.					
10	Rate your proficiency in understanding the electro pneumatic control concept.					

Signature of Student

RAO BAHADUR Y. MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI
Department of Mechanical Engineering

Ro. No.	USN	Name of the Student	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Sign
A-1	3VC16ME007	ABHISHEK SINHA	5	3	5	3	5	3	5	4	3	3	
A-2	3VC17ME001	AJAY REDDY N	5	3	5	3	5	3	5	4	3	3	
A-3	3VC17ME002	AKASHA GOUDA H	5	5	5	5	5	5	5	5	5	5	
A-4	3VC17ME003	ANIL KITTUR	5	5	5	5	5	5	5	5	5	5	
A-5	3VC17ME004	BHARATHISHA A B	5	5	5	5	5	5	5	5	5	5	
A-6	3VC17ME005	BHARGHAV R	4	4	4	4	5	4	4	4	4	5	
A-7	3VC17ME006	C ESHWAR	5	5	4	5	5	5	5	4	5	5	
A-8	3VC17ME007	DEEPAK PATIL S R	5	5	5	5	5	5	5	5	5	5	
A-9	3VC17ME008	DODDA BASAVA B	5	5	5	4	4	5	5	5	4	4	
A-10	3VC17ME009	DURJAYA K B	5	5	5	5	3	5	5	5	5	3	
A-11	3VC17ME010	EARESH VARMA C	5	5	5	5	4	5	5	5	5	4	
A-12	3VC17ME012	ERANAGOUDA K M	5	5	5	5	5	5	5	5	5	5	
A-13	3VC17ME014	G RANJITH	5	5	4	5	5	5	5	4	5	5	
A-14	3VC17ME016	G S SREE HARSHA	5	5	5	5	3	5	5	5	5	3	
A-15	3VC17ME018	GANESH GOWDA M	5	5	5	4	4	5	5	5	4	4	
A-16	3VC17ME019	GANESH J	5	5	5	5	5	5	5	5	5	5	
A-17	3VC17ME020	GURUSIDDANA	5	5	5	5	5	5	5	5	5	5	
A-18	3VC17ME021	HAMPANNA	5	5	5	5	5	5	5	5	5	5	
A-19	3VC17ME022	HANUMESH	5	5	5	5	5	5	5	5	5	5	
A-20	3VC17ME023	J M ABDUL KHADER B	5	5	5	5	5	5	5	5	5	5	
A-21	3VC17ME024	JAGADEESH	4	4	4	4	5	4	4	4	4	5	
A-22	3VC17ME025	JEFFREY SUJAN	5	5	4	5	5	5	5	4	5	5	
A-23	3VC17ME027	K M PARIKSHITH	5	5	5	5	5	5	5	5	5	5	
A-24	3VC17ME028	KAISARAHMED D	5	5	5	4	4	5	5	5	4	4	
A-26	3VC17ME030	KARTHIK R B	5	5	5	5	3	5	5	5	5	3	
A-27	3VC17ME031	KIRAN MATH	5	5	5	5	4	5	5	5	5	4	
A-28	3VC17ME032	LOKESHA NAIK	5	5	5	5	5	5	5	5	5	5	
A-29	3VC17ME033	M CHAITANYA	5	5	4	5	5	5	5	4	5	5	
A-30	3VC17ME041	MD AZAM J	5	5	5	5	3	5	5	5	5	3	
A-31	3VC17ME043	MOHAN E	5	5	5	4	4	5	5	5	4	4	
A-32	3VC17ME046	NAVEEN S	4	4	4	4	5	4	4	4	4	5	
A-33	3VC17ME049	PAVAN KUMAR B	5	5	4	5	5	5	5	4	5	5	
A-34	3VC17ME054	PAVITHRA R	5	5	5	5	5	5	5	5	5	5	
A-35	3VC17ME081	VINAY KUMAR S	5	5	5	4	4	5	5	5	4	4	
A-36	3VC17ME425	S MUSHTAQ	5	5	5	5	3	5	5	5	5	3	
A-37	3VC18ME401	ANAND K R	5	5	5	5	4	5	5	5	5	4	
A-38	3VC18ME402	ANIL KUMAR V	5	5	5	5	5	5	5	5	5	5	
A-39	3VC18ME411	H M UDAY KUMAR	5	5	4	5	5	5	5	4	5	5	
A-40	3VC18ME413	IMRAN ABDUL W	5	5	5	5	3	5	5	5	5	3	
A-41	3VC18ME415	K VINAY KUMAR	5	5	5	4	4	5	5	5	4	4	
A-42	3VC18ME418	KIRAN KUMAR D	5	5	4	5	5	5	4	5	5	5	
A-43	3VC18ME420	KUMAR K	5	5	5	5	5	5	4	5	4	5	
A-44	3VC18ME423	MADHUSUDHAN	5	5	5	5	5	4	5	5	5	5	
A-45	3VC18ME424	MAHANTESH H M	5	5	5	5	3	5	5	5	5	3	
A-46	3VC18ME425	MANIKANTA K	5	5	5	4	4	5	5	5	4	4	
A-47	3VC18ME431	MULLA ALTAF	4	4	4	4	5	4	4	4	4	5	
A-48	3VC18ME433	NISAR AHAMED K	5	5	4	5	5	5	5	4	5	5	
A-51	3VC18ME441	SAGAR MP	5	5	5	5	3	5	5	5	5	3	
A-52	3VC18ME443	SAMPATH KUMAR	5	5	5	4	4	5	5	5	4	4	
A-53	3VC18ME444	SANTOSH G	4	4	4	4	5	4	4	4	4	5	
A-54	3VC18ME446	K SHIVA KUMAR	5	5	4	5	5	5	5	4	5	5	
A-55	3VC18ME449	SHIVA SHANKAR	5	5	5	5	5	5	5	5	5	5	
A-56	3VC18ME454	THIPPESWAMY	5	5	5	4	4	5	5	5	4	4	
A-57	3VC18ME455	THIPPESWAMY	5	5	5	5	3	5	5	5	5	3	
A-58	3VC18ME457	V SIDDHI VINAY	5	5	5	5	4	5	5	5	5	4	
A-59	3VC18ME459	VINOD KUMAR	5	5	5	5	5	5	5	5	5	5	
A-60	3VC18ME460	VISHWANATH H	5	5	4	5	5	5	5	4	5	5	

ACTION REPORT ON GAP ANALYSIS

Course Outcomes	Action proposed to bridge the gap	Modification of target if achieved
17C402.1	Nil	Nil
17C402.2	Nil	Nil
17C402.3	Nil	Nil
17C402.4	Nil	Nil
17C402.5	Nil	Nil

Note:

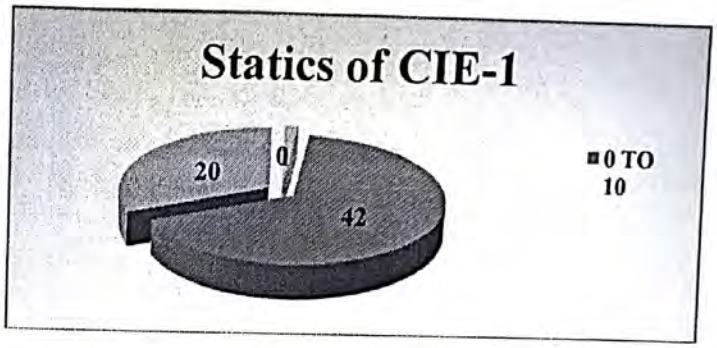
1. Suitable action to be initiated to fill the gap at the course coordinator level and the same has to be documented.
2. If the targets are achieved then higher targets may be set.
3. If the targets are not achieved then planning must be done with respect to Improvements in teaching /learning process so as to meet the target

FINAL RESULT ANALYSIS

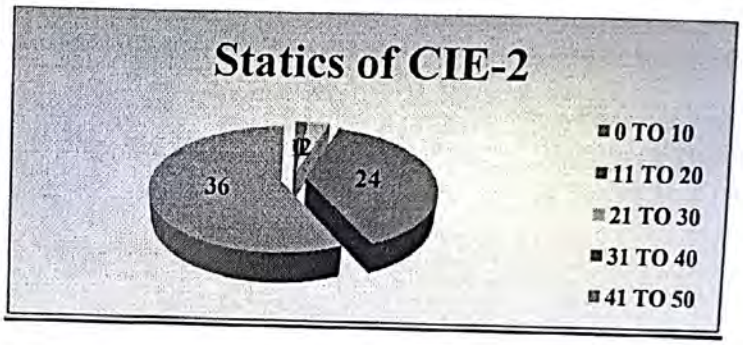
Result analysis has been done w.r.t **CIE** and **SEE** for the academic year 2020-2021.

STATISTICS OF CONTINUOUS INTERNAL EVALUATION

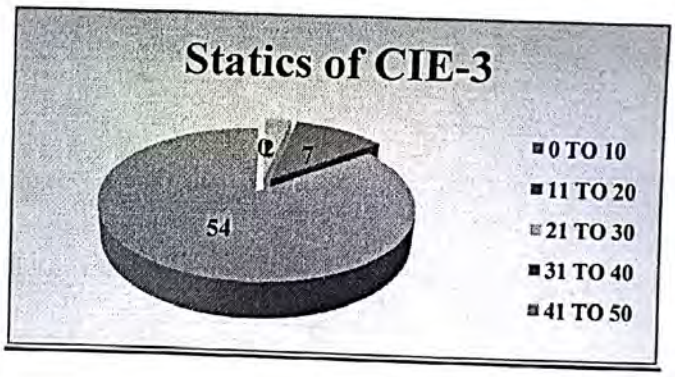
CIE - 1		No. of Students
Marks Range	0 TO 10	0
	11 TO 20	0
	21 TO 30	1
	31 TO 40	42
	41 TO 50	20
Total Number of Students		63



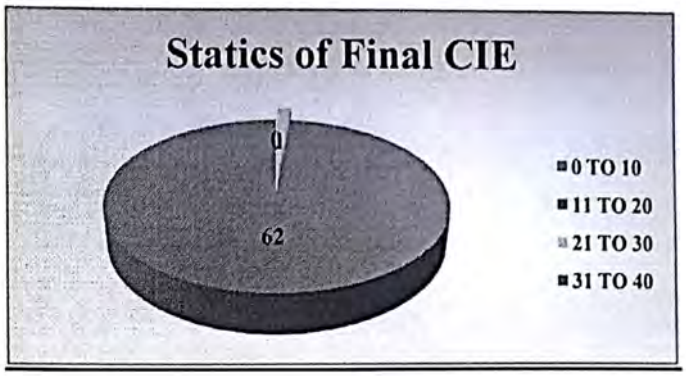
CIE - 2		No. of Students
Marks Range	0 TO 10	1
	11 TO 20	0
	21 TO 30	2
	31 TO 40	24
	41 TO 50	36
Total Number of Students		63



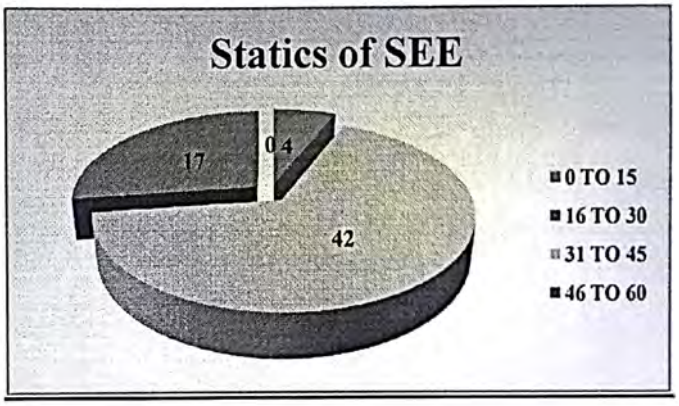
CIE - 3		No. of Students
Marks Range	0 TO 10	0
	11 TO 20	0
	21 TO 30	2
	31 TO 40	7
	41 TO 50	54
Total Number of Students		43



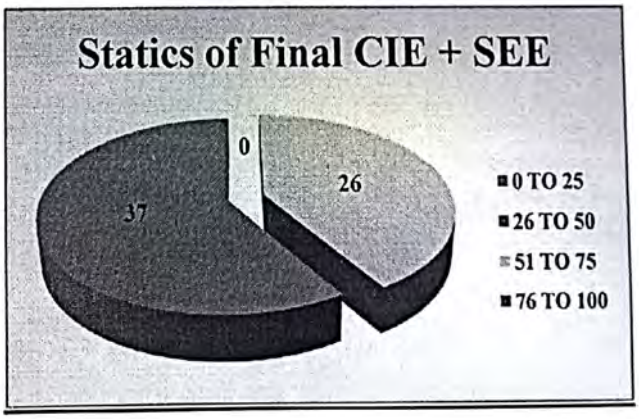
FINAL CIE		No. of Students
Marks Range	0 TO 10	0
	11 TO 20	0
	21 TO 30	1
	31 TO 40	62
Total Number of Students		63



SEE		No. of Students
Marks Range	0 TO 15	0
	16 TO 30	4
	31 TO 45	42
	46 TO 60	17
Total Number of Students		63



Final CIE + SEE		No. of Students
Marks Range	0 TO 25	0
	26 TO 50	0
	51 TO 75	26
	76 TO 100	37
Total Number of Students		63



DIRECT & INDIRECT ATTAINMENT OF COs, POs, PSOs 2020-21

DIRECT CO ATTAINMENT GAP ANALYSIS 2020-21

Course Outcomes	CO Direct Attainment ={0.70(SEE)+0.30(CIE)}*100	CO Target	CO Attainment Gap
17C402.1	0.89	60	Nil
17C402.2	0.89	60	Nil
17C402.3	0.89	60	Nil
17C402.4	0.89	60	Nil
17C402.5	0.89	60	Nil

DIRECT & INDIRECT CO ATTAINMENT GAP ANALYSIS 2020-21

Course Outcomes	CO Direct & Indirect Attainment ={0.70(SEE)+0.30(CIE)}*100	CO Target	CO Attainment Gap
17C402.1	0.91	60	Nil
17C402.2	0.92	60	Nil
17C402.3	0.88	60	Nil
17C402.4	0.93	60	Nil
17C402.5	0.81	60	Nil

RAO BAHADUR Y MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI DEPARTMENT OF MECHANICAL ENGNEERING

DIRECT ATTAINMENT 2020-21

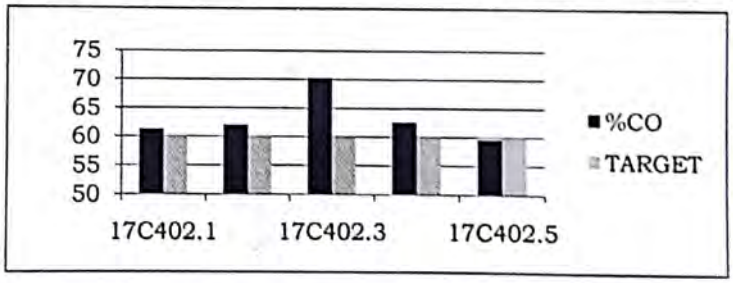
Faculty: Dr G Manjunath Swamy
Subject: Fluid Power System- 17ME72
SEM: VII
Code: 17C402
SEC: A

COURSE OUTCOME STATEMENT	
17C402.1	Identify and analyse the functional requirements of a fluid power transmission system for a given application.
17C402.2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function.
17C402.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electrohydraulics, electro-pneumatics for a given application.
17C402.4	Select and size the different components of the circuit.
17C402.5	Develop a comprehensive circuit diagramby integrating the components selected for the given application.

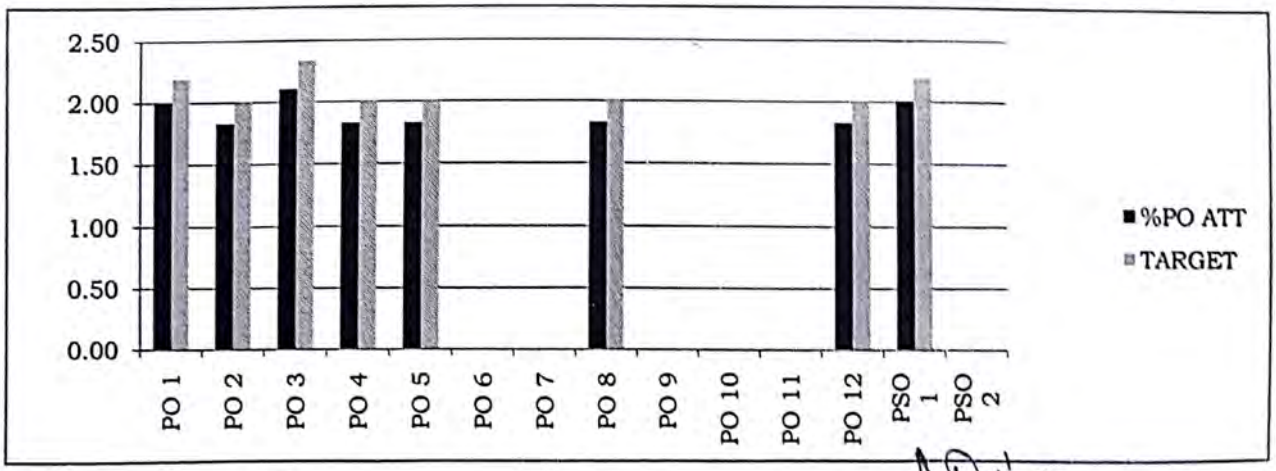
CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
17C402.1	2	2	0	2	2	0	0	2	0	0	0	2	2	0
17C402.2	2	2	2	2	2	0	0	2	0	0	0	2	2	0
17C402.3	3	2	3	2	2	0	0	2	0	0	0	2	3	0
17C402.4	2	2	0	2	2	0	0	2	0	0	0	2	2	0
17C402.5	2	2	2	2	2	0	0	2	0	0	0	2	2	0

	%CO	TARGET
17C402.1	61.3	60
17C402.2	62.09	60
17C402.3	70.24	60
17C402.4	62.63	60
17C402.5	59.6	60



	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
%PO ATT	2.01	1.83	2.10	1.83	1.83			1.83				1.83	2.01	
TARGET	2.2	2	2.33	2	2			2				2	2.2	



Head of the Department,
Mechanical Engineering Department.
R.Y.M. Engineering Collage,
ment. BELLARY-583 104

RAO BAHADUR Y MAHABALESWARAPPA ENGINEERING COLLEGE, BALLARI DEPARTMENT OF

MECHANICAL ENGNEERING

DIRECT AND INDIRECT ATTAINMENT 2020-21

Faculty: Dr G Manjunath Swamy **Code:** 17C402

Subject: Fluid Power System- 17ME72

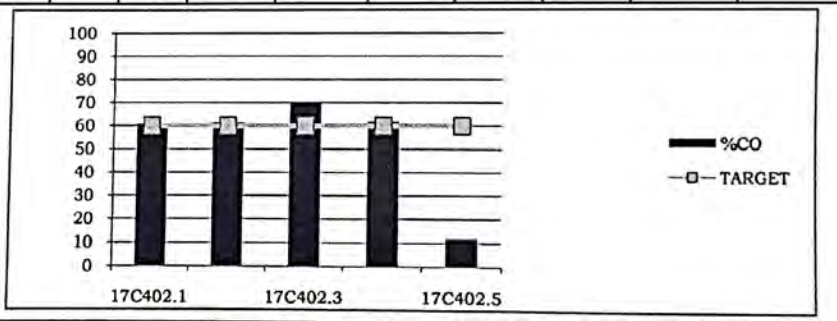
SEM: VII **SEC:** A

COURSE OUTCOME STATEMENT	
17C402.1	Identify and analyse the functional requirements of a fluid power transmission system for a given application.
17C402.2	Visualize how a hydraulic/pneumatic circuit will work to accomplish the function.
17C402.3	Design an appropriate hydraulic or pneumatic circuit or combination circuit like electrohydraulics, electro-pneumatics for a given application.
17C402.4	Select and size the different components of the circuit.
17C402.5	Develop a comprehensive circuit diagramby integrating the components selected for the given application.

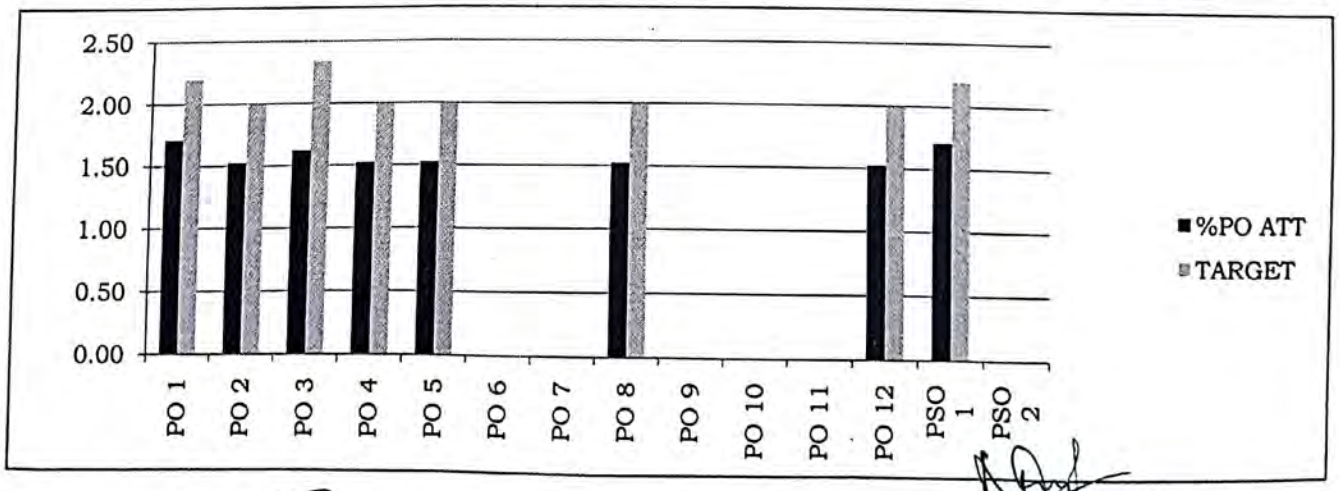
CO-PO/PSO Mapping

	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
17C402.1	2	2	0	2	2	0	0	2	0	0	0	2	2	0
17C402.2	2	2	2	2	2	0	0	2	0	0	0	2	2	0
17C402.3	3	2	3	2	2	0	0	2	0	0	0	2	3	0
17C402.4	2	2	0	2	2	0	0	2	0	0	0	2	2	0
17C402.5	2	2	2	2	2	0	0	2	0	0	0	2	2	0

	%CO	TARGET
17C402.1	60.72	60
17C402.2	61.4	60
17C402.3	70	60
17C402.4	61.78	60
17C402.5	11.84	60



	PO 1	PO 2	PO 3	PO 4	PO 5	PO 6	PO 7	PO 8	PO 9	PO 10	PO 11	PO 12	PSO 1	PSO 2
%PO ATT	1.70	1.53	1.62	1.53	1.53			1.53				1.53	1.70	
TARGET	2.2	2	2.33	2	2			2				2	2.2	



Head of the Department,
Mechanical Engineering Department.

ACTION REPORT ON GAP ANALYSIS

Course Outcomes	Action proposed to bridge the gap	Modification of target if achieved
17C402.1	Target achieved	Higher target will be set for next academic batch
17C402.2	Target achieved	Higher target will be set for next academic batch
17C402.3	Target achieved	Higher target will be set for next academic batch
17C402.4	Target achieved	Higher target will be set for next academic batch
17C402.5	Target achieved	Higher target will be set for next academic batch

Note:

1. Suitable action to be initiated to fill the gap at the course coordinator level and the same has to be documented.
2. If the targets are achieved then higher targets may be set.
3. If the targets are not achieved then planning must be done with respect to Improvements in teaching /learning process so as to meet the target

CONTENT BEYOND THE SYLLABUS

Related work on single actuator

Using single spool-type valve i.e., one spool-type valve can operate just a single actuator so, number of spool-type valves are requires number of actuators, and thus it increases cost of the system; reduces the speed and required more time and space. All these proposed method result in high cost and low speed [4, 10]. In this paper, authors have proposed a novel method using single valve to operate multiple actuators. The figure 2(a) shows how the single spool-type valves operate the single actuator. The regulator bulk includes spool-type valves which can be located physically.

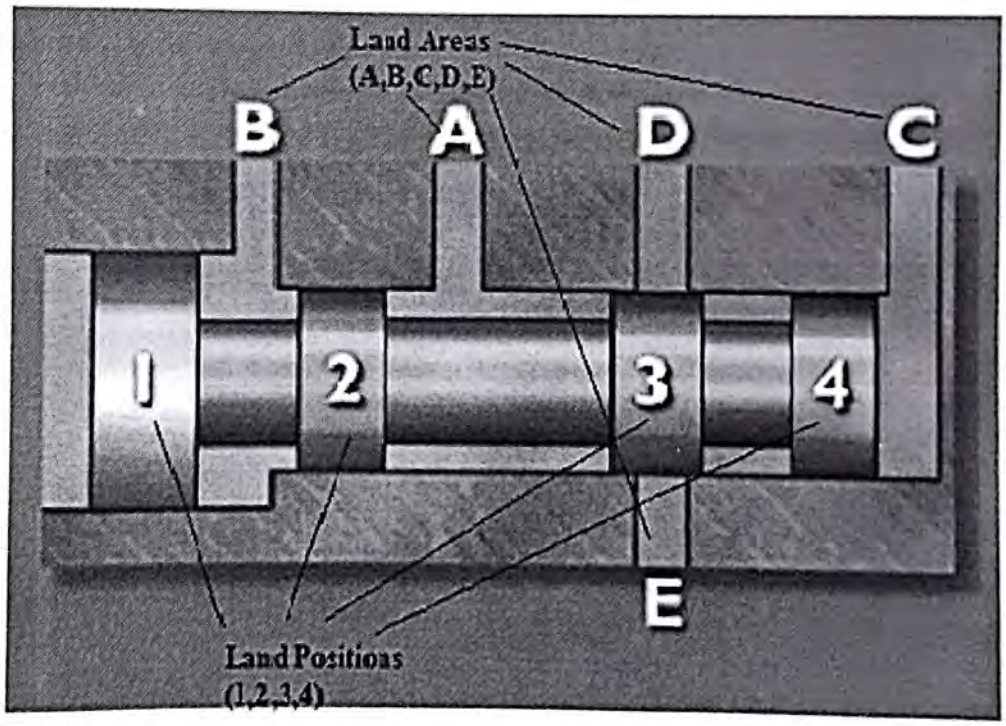
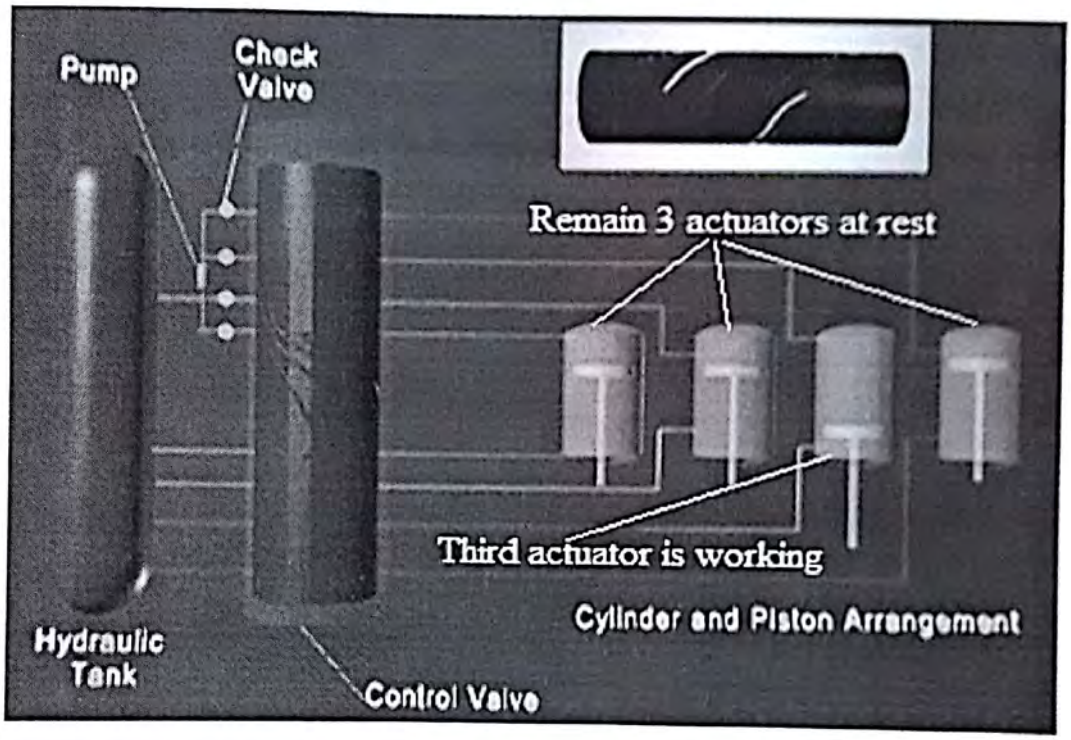


Fig 12.1 spool-type directional operate valve [10]

Spool-type valves can be situated physically and in numerous application having differential land of dissimilar diameter. Inside this model, the various widths bring about a bigger look region on land 1 than land 2. This is identified as a discrepancy region and while liquid beneath strain enters at Port B, this discrepancy zone makes a differential power. This move the valve to one side since the power following up on land-1 is more prominent than the power on land-2. On the other hand, the valve can be motivated through conceding liquid at Port-C. In the two situations the valve development enables recently jammed liquid at 'D' to stream b/w lands 3 & 4 to

debilitate at 'E' or to go to some other piece of the framework. On the off chance that liquid pressure is expelled from C the valve will stay inactive. Regardless of whether liquid is conceded at port A, no development can happen as the zones on lands 2 and 3 are equivalent and both create an equivalent power. It can turn the progression of water driven liquid from a pressure driven siphon to an actuator ON or OFF the course the liquid takes.



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COURSE OWNER/INSTRUCTOR REPORT

Staff Name: Dr G Manjunath Swamy **Academic Year: 2020-21**

Subject Name/Subject Code: FPS/17ME72 **Sem/Sec :VII/A**

Impact of Delivery Methods (state the delivery methods used and its effectiveness) :	• Chalk and talk • PowerPoint Presentations
Course Outcome Attainment Remarks	• Target Achieved and Higher Target will be set for next academic year
Course Owner Feedback: (w.r.t feedback regarding their subject) (w.r.t Scope for improvement)	• Student feedback rating GOOD • Innovative questions /text book questions to be discussed to improve their problem-based learning skills.
Analysis Based on Present and Previous Results	Previous: 100% Present 100%
Workshop/Seminar/Innovative Practices : adopted/conducted by course owner/external resource person to improve the performance of students	• Assignments given on Indexing valves and fabrication Technology
Student activities like blended learningquiz/LbD/NPTEL/MOOC etc conducted to strengthen the cours	Providing hands on experience to the students on this technology a providing an opportunity to design and build the parts on their own using this concept. Motivating the students to carry out research projects on this technolo and inspiring them to think out of box to design and develop their o components for certain useful applications.

Signature of Staff Member