NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

DEPARTMENT OF MECHANICAL ENGINEERING

COURSE PLAN – PART I			
Name of the programme and specialization	**B. TECH MECHANICAL ENGINEERING**		
Course Title	**OIL HYDRAULICS AND PNEUMATICS**		
Course Code	**MEPE24**	**No. of Credits**	**3**
Course Code of Pre-requisite subject(s)	**MEPC18**		
Session	**July 2019**	**Section (if, applicable)**	**A / B**
Name of Faculty	**P KAUSHIK**	**Department**	**MECHANICAL ENGINEERING**
Official Email	**pkaushik@nitt.edu**	**Telephone No.**	
Name of Course Coordinator(s) (if, applicable)	**N.A.**		
Official E-mail		**Telephone No.**	
Course Type (please tick appropriately**)**	**Elective course**		

Syllabus (approved in BoS)

Basic concepts of fluid power system design -Hydraulic oils and fluid properties –Seals and Seal materials -Filters and Filtration.

Hydraulic pumps, cylinders, and motors -Construction, sizing, and selection.

Control valves; pressure, flow, and direction -Servo-valves.

Basic hydraulic circuits, hydrostatic transmission-Cartridge valve circuits.

Control of hydraulic circuits -Electrical, electronics, and PLC -Pneumatic components and basic circuits

Reference Books:

1. Esposito. A., Fluid Power with Applications, 5thed., Pearson Education, 2003.

2. Industrial Hydraulics, Vickers -Sperry Manual, 2002.

COURSE OBJECTIVES

1. The cognitive objective of this course is for each student to comprehend foundational knowledge needed to perform stated entry-level industry competencies.
2. The performance objective of this course is for each student to apply foundational knowledge to hydraulic and pneumatic problems and exercises encountered in class.

MAPPING OF COs with POs

Course Outcomes	**Programme Outcomes (PO)** (Enter Numbers only)
1. Recall various fluid properties and identify the appropriate fluid power system for particular application.	**PO1, PO2**
2. Recognize the suitable pump and actuators for particular application.	**PO2, PO3**
3. Select various control valves such as pressure control, flow control, direction control valves and use them in hydraulic and pneumatic circuit development.	**PO3, PO5**
4. Analyze the hydraulic and pneumatic circuit for energy efficiency.	**PO2, PO5, PO6**
5. Select the appropriate control system like electrical, electronics, and PLC to control the fluid power system.	**PO1, PO2,PO3**
6. Trouble-shoot and identify maintenance problems associated with fluid power system.	**PO2, PO5**

COURSE PLAN – PART II

COURSE OVERVIEW

COURSE TEACHING AND LEARNING ACTIVITIES **(** Add more rows)

S.No.	**Week/Contact Hours**	**Topic**	**Mode of Delivery**
1	1st Week	Introduction	Chalk and Talk
2	2nd Week	Basic concepts	Chalk and Talk
3	3rd Week	Hydraulic oils and fluid properties	Chalk and Talk
4	4th Week	Seals and Seal materials -Filters and Filtration	Chalk and Talk
5	5th Week	Hydraulic pumps, cylinders, and motors -Construction, sizing, and selection.	Chalk and Talk

6	6th Week	Hydraulic pumps, cylinders, and motors -Construction, sizing, and selection. Continued	Chalk and Talk
7	7th Week	Control valves; pressure, flow, and direction	Chalk and Talk/PPT
8	8th Week	Servo-valves.	Chalk and Talk/PPT
9	9th Week	Basic hydraulic circuits	Chalk and Talk
10	10th Week	hydrostatic transmission-Cartridge valve circuits.	Chalk and Talk/PPT
11	11th Week	Control of hydraulic circuits - Electrical, electronics	Chalk and Talk
12	12th Week	Pneumatic components and basic circuits	Chalk and Talk/PPT
13	13th Week	Pneumatic components and basic circuits continued	Chalk and Talk/PPT
14	14th Week	Revision	Chalk and Talk

COURSE ASSESSMENT METHODS (shall range from 4 to 6**)**

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Quiz 1	26-30 Aug 2019	1 hour	10
2	Mid Semester Exam	23-27 Sept 2019	2 hours	30
3	Quiz 3	04-08 Nov 2019	1 hour	10
4				
CPA	Compensation Assessment*	11-15 Nov 2019	2 hours	30

5				
6	Final Assessment *	18-22 Nov 2019	3 hours	50

***mandatory; refer to guidelines on page 4**

COURSE EXIT SURVEY (mention the ways in which the feedback about the course shall be assessed)

Feedback will be taken in written form from the students.

COURSE POLICY (including compensation assessment to be specified**)**

Only genuine cases will be considered for compensation assessment with proper documentary evidence.

ATTENDANCE POLICY (A uniform attendance policy as specified below shall be followed)

- At least 75% attendance in each course is mandatory.
- A maximum of 10% shall be allowed under On Duty (OD) category.
- Students with less than 65% of attendance shall be prevented from writing the final assessment and shall be awarded 'V' grade.

ACADEMIC DISHONESTY & PLAGIARISM

- Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
- Zero mark to be awarded for the offenders. For copying from another student, both students get the same penalty of zero mark.
- The departmental disciplinary committee including the course faculty member, PAC chairperson and the HoD, as members shall verify the facts of the malpractice and award the punishment if the student is found guilty. The report shall be submitted to the Academic office.
- The above policy against academic dishonesty shall be applicable for all the programmes.

ADDITIONAL INFORMATION, IF ANY

FOR APPROVAL

Course Faculty _____ **CC- Chairperson** _____ 30/7/19 **HOD** _____ 31/7/19

Guidelines

a) The number of assessments for any theory course shall range from 4 to 6.

b) Every theory course shall have a final assessment on the entire syllabus with at least 30% weightage.

c) One compensation assessment for absentees in assessments (other than final assessment) is mandatory. Only genuine cases of absence shall be considered.

d) The passing minimum shall be as per the regulations.

B.Tech. Admitted in				P.G.
2018	2017	2016	2015	
35% or (Class average/2) whichever is greater.		(Peak/3) or (Class Average/2) whichever is lower		40%

e) Attendance policy and the policy on academic dishonesty & plagiarism by students are uniform for all the courses.

f) Absolute grading policy shall be incorporated if the number of students per course is less than 10.

g) Necessary care shall be taken to ensure that the course plan is reasonable and is objective.