

DEPARTMENT OF MECHANICAL ENGINEERING
NATIONAL INSTITUTE OF TECHNOLOGY, TIRUCHIRAPPALLI

COURSE PLAN – PART I			
Name of the programme and specialization	B.Tech. MECHANICAL ENGINEERING		
Course Title	THERMODYNAMICS AND FLUID MECHANICS LABORATORY		
Course Code	ICLR10	No. of Credits	2
Course Code of Pre-requisite subject(s)	NIL		
Session	July 2023	Section (if, applicable)	A
Name of Faculty	Dr. NANDA NAIK KORRA	Department	Mechanical Engineering
Email	naik@nitt.edu	Telephone No.	9894472210
Course Type	<input checked="" type="checkbox"/> Essential Lab Requirement		

Syllabus (approved in BoS)

List of Experiments:

Thermodynamics

1. Performance test on Petrol and Diesel Engines with Mechanical and Electrical Dynamometers
2. Morse test on multi-cylinder petrol engine
3. Determination of volumetric efficiency on Diesel engine and Two stage reciprocating Air compressor
4. COP in compression refrigerator cycle
5. Test on Air conditioning system
6. Viscosity index of lubricant
7. Study of steam power plant

Fluid Mechanics

1. Determination of pipe friction
2. Calibration of flow meters - Venturi meter and Orifice meter
3. Determination of discharge coefficients for notches
4. Determination of minor losses
5. Centrifugal pump
6. Submersible pump
7. Jet pump
8. Gear pump
9. Screw pump

COURSE OBJECTIVES

1. To familiarize with the principles of thermal energy and its transformation to mechanical energy.
2. To introduce about thermodynamics - concepts and properties, first and second law.
3. To provide a working knowledge of thermodynamics and fluid mechanics.

COURSE OUTCOMES (CO)

Course Outcomes	Aligned Programme Outcomes (PO)
1. Understand heat, work, internal energy, and 1st and 2nd law of thermodynamics.	1,2,3,4,7,8
2. Carryout dimensional analysis, fluid statics and dynamics.	3,5,6,7,10
3. Demonstrate fluid mechanics fundamentals, including concepts of mass and momentum conservation.	8,9,11,12
4. Apply the Bernoulli equation and control volume analysis to solve problems in fluid mechanics.	1,2,3,5,7,10,11,12

COURSE PLAN – PART II**COURSE OVERVIEW**

Thermodynamics is a branch of physics that deals with heat, work, and temperature, and their relation to energy, entropy, and the physical properties of matter and radiation.

Fluid mechanics is the study of fluid behavior (liquids, gases, blood, and plasmas) at rest and in motion.

COURSE TEACHING AND LEARNING ACTIVITIES

S.No.	Topic	Mode of Delivery
1	Performance test on Petrol and Diesel Engines with Mechanical and Electrical Dynamometers	Practical experiments
2	Morse test on multi-cylinder petrol engine	Practical experiments
3	Determination of volumetric efficiency on Diesel engine and Two stage reciprocating Air compressor	Practical experiments
4	COP in compression refrigerator cycle	Practical experiments
5	Test on Air conditioning system	Practical experiments
6	Viscosity index of lubricant	Practical experiments
7	Study of steam power plant	Demonstration
8	Determination of pipe friction	Practical experiments
9	Calibration of flow meters - Venturi meter and Orifice meter	Practical experiments
10	Determination of discharge coefficients for notches	Practical experiments

11	Determination of minor losses	Practical experiments
12	Centrifugal pump	Practical experiments
13	Submersible pump	Demonstration
14	Jet pump	Demonstration
15	Gear pump	Demonstration
16	Screw pump	Demonstration

COURSE ASSESSMENT METHODS (shall range from 4 to 6)

S.No.	Mode of Assessment	Week/Date	Duration	% Weightage
1	Experimentation	Every week	3 hour	70%
2	Record			
3	Viva - Voce			
4	Final Assessment	Last week	3 hour	30%

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

1. Students can meet the faculty at any stage in the course duration in case he/she finds difficulty in understanding the concept.
2. Feedback form issued to students to express their comments about the course after completing the syllabus. Students are requested to give genuine feedback about the course.
3. Student knowledge about the topic covered in this course will be judged based on the marks obtained in the written examinations.

COURSE POLICY (preferred mode of correspondence with students, compensation assessment policy to be specified)

MODE OF CORRESPONDENCE (email/ phone etc)

Students can reach course faculty by fixing appointment through E-mail naik@nitt.edu

COMPENSATION ASSESSMENT POLICY

Only one lab session will be permitted.

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

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

ACADEMIC DISHONESTY & PLAGIARISM

1. Possessing a mobile phone, carrying bits of paper, talking to other students, copying from others during an assessment will be treated as punishable dishonesty.
2. Zero mark to be awarded for the offenders. For copying from another student, both



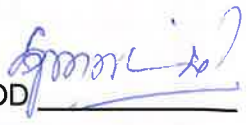
students get the same penalty of zero mark.

3. 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

FOR APPROVAL

Course Faculty  CC-Chairperson  HOD 

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.