




**Ahmedabad  
University**



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Course	CHE312 Experiments in Fluid Flow and Heat Transfer	Semester	Monsoon Semester 2024										
Faculty Name(s)	Arijit Ganguli, Deepshikha Singh	Contact	arijit.ganguli@ahduni.edu.in, deepshikha.singh@ahduni.edu.in										
School	SEAS	Credits	1.5										
GER Category:		Teaching Pedagogy Enable:NO	P/NP Course: Can not be taken as P/NP										
Schedule	<table> <tr> <td rowspan="2">Section 1</td> <td>02:30 pm to 04:00 pm</td> <td>Mon</td> <td colspan="2">01-08-24 to 26-11-24</td> </tr> <tr> <td>04:00 pm to 05:30 pm</td> <td>Mon</td> <td colspan="2">01-08-24 to 26-11-24</td> </tr> </table>				Section 1	02:30 pm to 04:00 pm	Mon	01-08-24 to 26-11-24		04:00 pm to 05:30 pm	Mon	01-08-24 to 26-11-24	
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Prerequisite	CHE201 Fluid Mechanics & CHE301 Heat Transfer												
Antirequisite	Not Applicable												
Corequisite	Not Applicable												
Course Description	The experiments are designed to verify the principles of two courses Fluid Mechanics and Heat transfer and provide hands on practice on proto type equipment												
Course Objectives	The objective of the laboratory Experiments is to enable the student to learn the subjects from practical pint of view and gain knowledge in handling the lab equipment The purpose of this laboratory is to reinforce and enhance students understanding of the fundamentals of Fluid Mechanics ( Fluid Flow) and Heat Transfer . The experiments are designed to understand the basic principles and application thereof												

Learning Outcomes	<p>At the end of the course, the student will be able to:</p> <ul style="list-style-type: none"> <li>• Comprehend principles for two unit operations viz Fluid Flow( Fluid Mechanics) and Heat Transfer</li> <li>• Gain a firm foundation in the technology and a good understanding of commonly encountered systems.</li> <li>• Hands on practice and confidence build up to operate the various equipment.</li> </ul>
Pedagogy	Experimental work, preparation of laboratory report
Expectation From Students	<ul style="list-style-type: none"> <li>• Must have known the subjects. They have studied the theories.</li> <li>• They must come prepared for the experiments to be performed .i.e theoretical background , read laboratory manual provided.</li> <li>• Follow the rules and regulations of laboratory.</li> <li>• Observe the safety aspects of laboratory work.</li> <li>• Not to operate any instrument, machine or equipment without lab instructor/lab Technician</li> </ul>
Assessment/Evaluation	<ul style="list-style-type: none"> <li>• Other Components: <ul style="list-style-type: none"> <li>◦ lab report preparation &amp; submission - 20%</li> <li>◦ performance - 25%</li> <li>◦ Viva - 15%</li> <li>◦ attendance - 10%</li> <li>◦ Quiz - 30%</li> </ul> </li> </ul>
Attendance Policy	As per Ahmedabad University Policy.
Project / Assignment Details	Student must complete all calculations in lab report and must submit in the very next laboratory turn
Course Material	<p>Other Course Material</p> <ul style="list-style-type: none"> <li>• Laboratory Manual,</li> <li>• Laboratory Manual,</li> <li>• Laboratory Manual,</li> <li>• Laboratory Manual,</li> </ul>
Additional Information	

## Session Plan

NO.	TOPIC TITLE	TOPIC & SUBTOPIC DETAILS	READINGS,CASES,ETC.	ACTIVITIES	IMPORTANT DATES
1	Introduction of laboratory	Introduction of Laboratory course and over views various experimental work to be performed in the semester	Prescribed text books and Lab manuals.	Discussion and laboratory tour	
2	Introduction and Hydraulic Bench	To demonstrate the objective and working principle of every experiment. To determine volumetric flow rate	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
3	Bernoulli's Principle	To verify the law of conservation of energy by finding out the pressure head and velocity head and applying the Bernoulli's equation to a Venturimeter.	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
4	Pipe friction for laminar, Turbulent flow	To determine pipe friction in laminar and turbulent flow.	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
5	Centrifugal Pump	characteristics of a centrifugal pump at different speeds.	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
6	Orifice and Jet Velocity	measure the orifice and jet velocity components	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
7	Flow Measuring Devices	Rota meter, Orifice meter, Ventury meter, Pitot tube, Notches	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
8	Introduction and Composite wall	To demonstrate the objective and working principle of every experiment. To study the heat transfer through conduction in composite wall.	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
9	Natural Convection	To study the heat transfer in natural convection	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	

10	Forced Convection	To study the heat transfer in forced convection	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
11	Stefan-Boltzmann's apparatus	To determine the Stefan- Boltzmann's constant in the radiation heat transfer.	Prescribed text books and Lab manuals.	Experiment Performance and laboratory report preparation	
12	Emissivity Measurement Apparatus	To calculate emissivity of a test plate			
13	Tubular shell and tube heat exchanger	To demonstrate the differences between co current flow (flows in same direction) and countercurrent flow (flows in the opposite direction) and the effect on the heat transferred, temperature efficiencies and temperature profiles through a Tubular Heat Exchanger.			
14	End semester Examination				
15	VIVA Examination				

