

**The University of Jordan  
School of Engineering**



Department	Course Name	Course Number	Semester
Mechanical Engineering	Thermal and Fluid Sciences Lab	0904249	

**2019 Course Catalog Description**

Liquid-vapor saturation curve. Flow through a nozzle. Heat pump and air-cooler. Friction and secondary losses in pipes. Hydrostatic pressure on a plane surface. Impact of water jet. Pump characteristics. Flow visualization. Thermal conductivity measurement.

**Instructors**

Name	E-mail	Sec	Office Hours		Lecture Time	

**Text Books**

	Text book 1	Text book 2
<b>Title</b>	Thermal and Fluid Sciences Laboratory Manuals	Instructor notes
<b>Author(s)</b>		
<b>Publisher, Year, Edition</b>		

**References**

<b>Books</b>	Y. A. Cengel, J. M. Cimbala and R. H. Turner, "Fundamentals of Thermal-Fluid Sciences", 5 <sup>th</sup> Ed. SI Units, McGraw Hill, 2017.
<b>Journals</b>	
<b>Internet links</b>	

**Prerequisites**

<b>Prerequisites by topic</b>	
<b>Prerequisites by course</b>	Thermal-fluid sciences 0904248
<b>Co-requisites by course</b>	
<b>Prerequisite for</b>	

**Topics Covered**

Week	Topics	Chapter in Text	Sections
1	Losses in pipes.		
2	Hydrostatic pressure force on a plane surface and center of pressure.		
3	Impact of a water jet.		
4	Flow through a nozzle.		
5	Thermal conductivity.		
6	Comparison of pump characteristics.		
7	Heat pump and air cooler.		
8	Liquid-Vapor saturation curve.		
9	Flow Visualization.		

**Mapping of Course Outcomes to ABET Student Outcomes**

SOs	Course Outcomes
5	1. Ability to work in a team in conducting experiments, collecting data, discussing results, and writing reports.

<b>6</b>	<ol style="list-style-type: none"> <li>2. Compare characteristics of pumps.</li> <li>3. Understand the working principles in heat pumps and air cooler.</li> <li>4. Perform flow visualization.</li> <li>5. Obtain liquid-vapor saturation curve.</li> <li>6. Ability to measure losses in pipes, hydrostatic pressure forces, impact of water jet, flow through nozzle, thermal conductivity.</li> </ol>
----------	---

<b>Evaluation</b>		
Assessment Tools	Expected Due Date	Weight
Reports and Participations		30 %
Midterm Exam		30 %
Final Exam		40 %

**Contribution of Course to Meet the Professional Components**

**Relationship to Student Outcomes**

SOs	1	2	3	4	5	6	7
Availability					X	X	

**Relationship to Mechanical Engineering Program Objectives (MEPOs)**

MEPO1	MEPO2	MEPO3	MEPO4	MEPO5

**ABET Student Outcomes (SOs)**

<b>1</b>	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics
<b>2</b>	An ability to apply engineering design to produce solutions that meet specified needs with consideration of public health, safety, and welfare, as well as global, cultural, social, environmental, and economic factors
<b>3</b>	An ability to communicate effectively with a range of audiences
<b>4</b>	An ability to recognize ethical and professional responsibilities in engineering situations and make informed judgments, which must consider the impact of engineering solutions in global, economic, environmental, and societal contexts
<b>5</b>	An ability to function effectively on a team whose members together provide leadership, create a collaborative and inclusive environment, establish goals, plan tasks, and meet objectives
<b>6</b>	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions
<b>7</b>	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies

**Updated by ABET Committee, 2021**