

**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.						
6	2. Compare characteristics of pumps. 3. Understand the working principles in heat pumps and air cooler. 4. Perform flow visualization. 5. Obtain liquid-vapor saturation curve. 6. Ability to measure losses in pipes, hydrostatic pressure forces, impact of water jet, flow through nozzle, thermal conductivity.						
Evaluation							
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)							
1	An ability to identify, formulate, and solve complex engineering problems by applying principles of engineering, science, and mathematics						
2	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						
3	An ability to communicate effectively with a range of audiences						
4	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						
5	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						
6	An ability to develop and conduct appropriate experimentation, analyze and interpret data, and use engineering judgment to draw conclusions						
7	An ability to acquire and apply new knowledge as needed, using appropriate learning strategies						
Updated by ABET Committee, 2024							