The University of Jordan
School of Engineering

Department	Course Name	Course Number	Semester
Mechanical Engineering	Fluid Mechanics Lab	0904362	

2019 Course Catalog Description

The purpose of this laboratory is to expose the students to the measurement tools and equipment and to provide them training in using these instruments in order to strengthen and deepen their understanding of the principles of these subjects The students will be exposed to the experimental methods in the following systems: centre of pressure, impulse-momentum principle, pumps, friction losses in pipes, stream lines and flow fields, buoyancy, Radial flow fan, Water turbine, and Flow visualization.

Instructors

Name	E-mail	Sec	Office Hours		Lecture Time	

Text Books

Title	Lab manual and lecture notes
Author(s)	Mechanical Engineering Department/The University of Jordan
Publisher, Year, Edition	Mechanical Engineering Department/ The University of Jordan

References

Books	Engineering Fluid Mechanics, Elger, D. F., Williams, B. C, Crowe, C. T., and Roberson, J. A., John Wiley and Sons., 2014, 10th edition, (SI units)
Journals	
Internet links	National Committee on Fluid Mechanics Films http://www.mit.edu/hml/ncfmf.html

Prerequisites

Prerequisites by topic	1. Fluid Statics. 2. Turbomachinery. 3. Energy Equation and its application. 4. Momentum equation. 5. Flow visualization.
Prerequisites by course	Fluid Mechanics (0904361)
Co-requisites by course	-
Prerequisite for	None

Topics Covered

Week	Topics	Chapter in Text	Sections
1	The performance of a radial flow fan		
2	Hydrostatic pressure force on a plane surface and center of pressure		
3	Losses in pipes (1)		
4	Losses in pipe bends (2)		
5	Hydraulic jump in open channel		
6	Performance of a turbine		
7	Impact of water jet		
8	Flow visualization		
9	Comparison of pump characteristics		

Mapping of Course Outcomes to ABET Student Outcomes

SOs	Course Outcomes
5	1. Work in teams and prepare technical reports
6	2. Apply the knowledge of hydrostatic loading 3. Study and visualize the flowing fluids, pressure variation, flow in pipes and the losses 4. Apply the mass, momentum and energy conservation laws to fluid mechanics' problems 5. Apply the knowledge of turbomachinery and flow in open channels

Evaluation

Assessment Tools	Expected Due Date	Weight
Reports		40%
Quizzes & Participation		20%
Final Exam		40 %

Contribution of Course to Meet the Professional Components

This course will expose the students to various experimental setup needed for their projects in other courses as well as the graduation project. The student gains the ability to understand and analyze a wide variety of fluid mechanics' systems.

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

Remarks

I. Minimum Student Materials	Lab. Manual, class handouts, engineering calculator.
II. Attendance	Attendance of classes is obligatory. Absence must be verified according to the university's regulation.
III. Quizzes	There will be a number of unannounced quizzes during the semester. Students are expected to be ready to take a quiz any time they have a lab. There will be no make-up quizzes.
IV. Report	•The report must represent an individual work of each subgroup. All reports should be submitted on the due date. The Reports should be collected at the beginning of the

laboratory on the due date. Late report will <u>NOT</u> be accepted (i.e., it will be awarded a zero). Please write only on one side of the page. Your name and ID number should be clearly written on first page. Clearly mark your answers in a box (Never use a red pen in your work). Staple the pages together. Copying any text or graphics from another group's report may be viewed as an attempt of plagiarism, and will be heavily penalized. All cases of academic dishonesty will be handled in accordance with university policies and regulations.

- Reports should be written on paper of standard size (A4, size 21 cm x 29.7 cm). The cover should have the title and students' names and numbers. On the cover page of the report, rewrite the title at the middle of the top.

- The report should proceed as follows:

1. Title Page
2. Objective(s) as points
3. Apparatus containing schematic drawings if necessary
4. Introduction and brief theory
5. Procedure as steps
6. Results containing tables, figures…etc. if necessary
7. Discussion of Results
8. Conclusions
9. References
10. Appendices if necessary

Updated by ABET Committee, 2021