

Course Title:	Fluid mechanics and thermal Lab.	Course Number:	12210341
Department:	Mechatronics Eng.	Designation:	Compulsory
Prerequisite(s):	Thermodynamics, fluid mechanics and heat transfer.		
Instructor:	Eng. Othman Abd Alrahman	Instructor's Office:	Fluid Lab. A027
Instructor's e-mail:	o.abdalrahman@ptuk.edu.ps		
Office Hours:	Sun., Tue.: (11:00 – 12:30)		
Time:	Sun. (13:00 – 15:00)	Class Room:	Fluid Lab. A027
Course description:	This course aims to provide students with the principles and applications of fluid mechanics and heat transfer; The laboratory of fluid mechanics and heat transfer complements the learning experience of the lecture. Laboratory exercises provide opportunities for direct study of fluid behavior and heat transfer. All of the laboratory experiments reinforced material presented in lecture		
Textbook(s):	<ol style="list-style-type: none"> 1. Fluid mechanics and thermal laboratory manual sheet 2. Jack B. Evett and Cheng Liu, "Fundamental of Fluid Mechanics" 3. Frank Krieth, William Black, "Basic heat transfer" 		
Other required material:	<ol style="list-style-type: none"> 1. Victor L., "Fluid mechanics" 5th edition. 2. A.T. and Fox N.R., "Introduction to Fluid mechanics", 2nd Edition. 3. J. P., "Heat Transfer", 3rd Edition, 4. Frank krieth, Raj M. Manglik and Mark S. Bohn, "Principles of Heat Transfer" 7th edition 		

Course objectives:	<ol style="list-style-type: none"> 1. Gain familiarity with physical manifestations of fluid mechanics and heat transfer. 2. Develop and reinforce measurement skills. 3. Develop and reinforce skills in documenting observations and report writing. 								
Topics covered:	<ol style="list-style-type: none"> 1. Volumetric Hydraulic Bench. 2. Pressure measurement bench. 3. Calibration of pressure gauge. 4. Venturi meter. 5. Flow measurements (rotameter, orifices...). 6. Center of pressure on plane surfaces. 7. Stability of floating body. 8. Thermal conductivity. 9. Linear heat conduction. 10. Radial heat conduction. 11. Extended surface heat transfer 								
Class/laboratory schedule:	1 lab. sessions each week; 120 minutes each								
Grading Plan:	<table> <tr> <td>Midterm Exam</td> <td>(25 Points)</td> </tr> <tr> <td>Reports</td> <td>(25 Points)</td> </tr> <tr> <td>Final Exam</td> <td>(35 Points)</td> </tr> <tr> <td>others</td> <td>(15 points)</td> </tr> </table>	Midterm Exam	(25 Points)	Reports	(25 Points)	Final Exam	(35 Points)	others	(15 points)
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General Notes:	<ol style="list-style-type: none"> 1. University regulation Regarding absentees will be Applied. 2. Names will be read in the first 10 minutes any one coming after that will be marked absent. 3. All mobiles must be switched off during class 								

Course contribution: State the contribution of course to meeting the professional component

Professional Component	Course Contribution
General Education	None
Basic Science and Mathematics	Applying the integration in analytical determination of position of center of pressure
Engineering Science	Apply Bernoulli principle, continuity equation, and Pascal law to find solutions and analyze for the practical problems
Engineering Design	ability to design fluid systems.

جامعة فلسطين التقنية



Kadoorie
Palestine Technical University

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PTU
Kadoorie خضوري

السلطة الوطنية الفلسطينية

وزارة التربية والتعليم العالي
Palestinian National Authority
Ministry of Education & Higher Education

Relationship to program outcomes: State the relationship of course to program outcomes

ABET (a-k)		Mechatronics Program Outcomes
a		ability to apply knowledge of math engineering and science
b	✓	ability to design and conduct experiments and ability to analyze and interpret data
c		ability to design system components or process to meet a need
d		ability to function in multidisciplinary teams
e		ability to identify, formulate and solve engineering problems
f		understanding professional and ethical responsibility
g		ability to communicate effectively
h		Broad education to understand the impact of engineering solutions in a global and societal context
i		recognition of need and ability to engage in lifelong learning
j		knowledge of contemporary issues
k	✓	ability to use techniques, skills and tools in engineering practice

Eng. Othman Abd Alrahman

Date:29/1/2017