Philadelphia University
Faculty of Engineering
Department of Mechatronics Engineering

First Semester, 2013/2014

Course Syllabus

Course Title: Thermo-fluid I	**Course code**: 0640335
Course Level: 3rd Year	**Course prerequisite(s):** 0620211 0650260
Lecture Time: 1:00-2:00 Sun, Tue & Thu	**Credit hours:** 3

Academic Staff Specifics

Name	Rank	Office No.	Office Hours	E-mail Address
Dr. Mohammad Al-Shabi	Assistant Prof.	406	11:15-12:45 Mon and Wed	mshabi@philadelphia.edu.jo

Course module description:

To make the students develop and enhance the knowledge and awareness of fluid mechanics and its applications in practice. The students will be introduced to fluid properties and hydrostatics forces and learn to link the concepts and applications of Bernoulli's & Euler's to flowing fluids, the concept of control volume approach including the principles and applications of continuity, momentum, energy. Also, The study the concept of dimensional analysis and its importance for analyzing model studies and for correlating the results of experimental research to their everyday world and previously learned concepts will be introduced. However, the students should have background knowledge in statics and calculus.

Course module objectives:

Upon completion of this course the student should be able to understand the following:

- Fluid Properties.
- Fluid Statics on Plane and Curved Surfaces. Concept of buoyancy, Stability of Immersed and Floating Bodies.
- One-Dimensional Continuity, Bernoulli's and Euler's Equations and its applications.
- Energy Equations and its applications.
- The Concept of Dimensional Analysis.

Course/ module components:

- **Books (title , author (s), publisher, year of publication):**
  - **"Engineering Fluid Mechanics",** Donlad F. Elger, Barbara C. Williams, Clayton T Crowe, & John a. Roberson, 10th edition, 2012.

- **Support material (s) (vcs, acs, etc).**
- **Study guide (s) (if applicable)**
- **Homework and laboratory guide (s) if (applicable).**

Teaching methods:

Lectures, discussion groups, tutorials, problem solving, etc.

Learning outcomes:

- Knowledge and understanding: The student should know the basic principles of fluid mechanics.
- Cognitive skills (thinking and analysis): Some projects assigned aim to develop the thinking and analysis capability of the students.
- Communication skills (personal and academic): One presentation for each student on one of the class topics.
- Practical and subject specific skills (Transferable Skills).

Assessment instruments

- **Homework**. One assignment is needed. The assignment is to be submitted by the last lecture just before the second exam. The assignment is submitted by group of students that does not exceed 3 members. The group should propose a printed copy of the assignment. A 15-min presentation is required.
- **Quizzes**. Three 10-minute quizzes will be given to the students throughout the semester. These quizzes will cover material discussed during the previous lecture.
- **Final examination**: 40 marks

Allocation of Marks	
Assessment Instruments	**Mark**
1st examination	**20%**
2nd examination	**20%**
Homework	**11%**
Quizzes	**9%**
Final Examination:	**40%**
Total	**100%**

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.
- **Ethics and Disability Act:**
  - Students may consult with one another on solutions, but copying another student's code is strictly prohibited.
  - Students should write their own code. Using code found on books or internet is prohibited.
  - The Instructor follows general university "Academic Dishonesty/Cheating Policy".

Course/module academic calendar

week	Basic and support material to be covered	Homework
(1)	Introduction and Fluid Properties	
(2)	Fluid Properties	
(3)		
(4)	Fluid statics	Q1
(5)		
(6)		
(7)	Bernoulli's and Euler's Equations	
(8)		Q2
(9)		
(10)	Control Volume Approach & Continuity Principle	Q3
(11)		
(12)	Momentum Principle	
(13)		HW
(14)	Energy Principle	Q4
(15)		

Expected workload:

On average students need to spend 6 hours of study and preparation each week.

Attendance policy:

Absence from lectures and/or tutorials shall not exceed 15%. Students who exceed the 15% limit without a medical or emergency excuse acceptable to and approved by the Dean of the relevant college/faculty shall not be allowed to take the final examination and shall receive a mark of zero for the course. If the excuse is approved by the Dean, the student shall be considered to have withdrawn from the course.

The student is responsible for all assignments on a weekly basis.

No make-up will be given for missed quizzes, tests or assignments, unless a case is made in advance with Instructor's approval.

Module references

Books

- Fundamentals of Engineering Fluid Mechanics, by Gerhard, Gross, Addison- Wesley, Latest Edition.
- Fluid Mechanics, by Douglas, Gasiorek, Swaffield, Pitman, Lasted Edition.
- Mechanics of Fluids, B.S Massey, Latest Edition.
- Mechanics of Fluid, A.C.Walshaw and D.A.Jobson, Latest Edition