



Philadelphia University
Faculty of Engineering
Department of Mechatronics Engineering
First semester, 2008/2009

Course Syllabus

Course Title: Thermo-fluids I	Course code: 640343
Course Level: 3d year	Course prerequisite (s) and/or corequisite (s): 630201,640232
Lecture Time: 08:15-09:45 M, W	Credit hours: 3

Academic Staff Specifics

Name	Rank	Office Number and Location	Office Hours	E-mail Address
Dr. A. Saleh	Assis. Prof.	E732 Department of Mechatronics	9:30- 11:00	asaleh@philadelphia.edu.jo

Course module description:

The course has the intention to make the student familiar with basic concepts used in thermal science, including behavior of simple pure substances, evaluation of work, heat and power in processes, formulation of conservation laws, and introduction to the Entropy concept

Course module objectives:

At completing this course the student should be able to:

- Identify work , heat transfer and the importance of temperature, pressure and density in a sub system. And find the properties of a substance given a certain property.
- Compute work and heat transfer in a problem.
- Distinguish between the different types of thermodynamic systems
- Apply the entropy concept in simple applications

Course/ module components

- **Books (title , author (s), publisher, year of publication)**
Title: Thermodynamics: An Engineering Approach
Author: Yunus A. Cengel, Michael A. Boles
Publisher: McGraw-Hill
Edition : 6th, 2008

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

Teaching methods:

- 3 Lectures a week
- 2-3 Appointments for tutorials and problem solving after each chapter

Learning outcomes:

- Knowledge and understanding
The student should know the basic principles of thermodynamics
- Cognitive skills (thinking and analysis).
Some projects assigned aim to develop the thinking and analysis capability of the students
- Communication skills (personal and academic).
Not applicable
- Practical and subject specific skills (Transferable Skills).
Some practical projects assigned aim to develop the practical capability of the students:
- be familiar with some related software

Assessment instruments

- Short reports and/ or presentations, and/ or Short research projects
- Quizzes.
- Home works
- Final examination: 50 marks

<u>Allocation of Marks</u>	
Assessment Instruments	Mark
First examination	20
Second examination	20
Final examination: 50 marks	50
Reports, research projects, Quizzes, Home works, Projects	10
Total	100

Documentation and academic honesty

- Documentation style (with illustrative examples)
- Protection by copyright
- Avoiding plagiarism.

Course/module academic calendar

week	Basic and support material to be covered	Homework/reports and their due dates
(1)	Introduction to basic concepts of thermodynamics	
(2)	Energy transfer and analysis	
(3)	Tutorial and problem solving	Selected typical Problems
(4)	First law of Thermodynamics (closed systems)	
(5)	First law of Thermodynamics (closed systems)	
(6)	Tutorial and problem solving	Selected typical Problems
(7)	First law of Thermodynamics (control volumes)	
(8)	First law of Thermodynamics (control volumes)	
(9) Mid Examination	Tutorial and problem solving	Selected typical Problems
(10)	Second law of Thermodynamics	
(11)	Second law of Thermodynamics	
(12)	Tutorial and problem solving	Design of simple thermal systems
(13)	Introduction to 'Entropy' concept	
(14)	Introduction to 'Entropy' concept	
(15)	Tutorial and problem solving	Report: importance of the Entropy concept
(16) Final Examination		

Expected workload:

On average students need to spend 2 hours of study and preparation for each 50-minute lecture/tutorial.

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.

Module references

Books

- Fundamentals of Classical Thermodynamics by Sonntag. Wiley
- Thermodynamics, By: Holman
- Introduction to Thermodynamics, by: Sonntag
- Basic Engineering Thermodynamics, By: Joel

Journals

- Journal of Heat Transfer
- Journal of Fluids Engineering Journal of Heat Transfer

Websites

<http://www.mcgrawhill.com/>