



Philadelphia University

Faculty of Engineering and Technology
Department of Mechanical Engineering

Course Information

Title:	Heat Transfer-2 (620426)
Prerequisite:	Heat Transfer-1 (620420)
Credit Hours:	3 Credit hours (16 weeks per semester, approximately 44 contact hours)
Textbook:	Principles of Heat and Mass Transfer, 7 th . edition, by Incropera, DeWitt, Bergman and Lavine, Wiley
References:	Heat Transfer, By J. P. Holman, 6 th . Edition, McGraw-Hill
Catalog Description:	Conduction heat transfer in 2-D and 3-D using finite difference technique; Transient conduction with spatial effects using analytical and finite difference method. Free convection; Boiling and condensation; Radiation heat transfer.
Instructor:	Prof. Ali Badran e-mail: abadran@philadelphia.edu.jo Engineering building, room E742, Ext. 2338 Office hours: Sun, Tue. Thurs: 10 -11:00

Course Topics

Week No.	Description	Chapter & Section
1, 2	Review of basic concepts in heat transfer	2
3, 4, 5	2-D and 3-D conduction heat transfer using finite difference technique.	4
6	Transient conduction with spatial effects using analytical and finite difference method	5.4, 5.5, 5.6, 5.7, 5.10
8, 9	Free convection.	9
10, 11	Boiling and condensation	10
12, 13, 14	Radiation heat transfer	12, 13
15, 16	Review and final exam	

Course Learning Outcomes and Relation to ABET Student Outcomes:

Upon successful completion of this course, a student should be able to:

1.	Identify and understand multi-dimensional modes of heat transfer in solids and fluids.	[a, c, e]
2.	Identify and understand transient conduction with spatial effects, both in analytical and finite difference methods.	[a, c, e]
3.	Apply forced convection similarity methods on various heat transfer modes	[c, k, e]
4.	Estimate free convection heat transfer within channels and enclosures	[c, k, e]
5.	Estimate forced convection heat transfer in boiling and condensation	[c, k, e]
6.	Analyze radiation processes and properties	[c, k, e]
7.	Calculate radiation exchange between various surfaces	[c, k, e, i]

Assessment tools:

Evaluation of students' performance (final grade) will be based on the following categories:

Exams: Two written exams will be given. Each will cover about 6-weeks of lectures

Quizzes: 15-minute quizzes will be given to the students during the semester. These quizzes will cover material given to students in the previous chapter.

Homework: Problem sets will be given to students. Homework should be solved individually but they do not have to be turned-in. Instead, students should be able to sit for a quiz in one of the homework problems or a problem similar to it..

Participation: The grade for participation will be based on quizzes

Final Exam: The final exam will cover all class material.

Grading policy:

First Exam	20%
Second Exam	20%
Quizzes and participation	20%
Final Exam	40%

Total: 100%

Attention to basic attendance policy:

Absence from classes 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.