King Fahd University of Petroleum & Minerals
Chemical Engineering Department

CHE-300

Heat Transfer(072)

Instructor: Dr. Mohammed Ba-Shammakh
Office: 16 – 207 Tel: 860-7464
E-mail: shammakh@kfupm.edu.sa
http://www.kfupm.edu.sa/che/FACF/bashammakh.HTM

Class time: 9:00 – 9:50 am (SMW)
Location: 4 – 151

Bulletin Description: Modes of heat transfer.Differential equations of energy transport.Steady and transientheat conduction.Free and forced convection in laminar and turbulent flows.Momentum and heat transfer analogies.Boiling and condensation.Radiation heat transfer.Aplication to the design of process heat transfer equipment.

Prerequisit e: CHE 204

Textbook: Heat transfer by J.P.Holman,9th ed.,McGraw-Hill, Singapore, 2002

Ref. Book: Fundemantals of Momentum, ,Heat, and Mass Transfer ,by J.R.Welty,E.Wicks,and R.E.Wilson ,3rd ed.,John Wiley&Sons,1984

Objective: Princibles of heat transfer.Conduction,convection,and radiation modes of heat transfer.Steady state and unsteady state analysis.Calculation of heat rate and heat transfer coefficients. Boiling and Conndesation .Princibles of heat exchangers design

Outcomes: Upon successful completion of this course, you will be able to:

1. Understand the three modes of heat transfer (Conduction, Convection ,and Radiation).
2. Calculate the heat transfer rate for single and composite walls
3. Calculate the thickness of insulation.
4. Calculate temperature distribution for unsteady state systems
5. Calculate heat transfer coefficients for different systems(including boiling and condensation)
6. Understand and design different types of heat exchangers.

Topics:

- Basic modes of heat transfer (Ch 1) 2 lectures
- Conduction heat transfer,steady and unsteady state (Ch 2 & 4) 14 lectures
- Multiple dimensions heat conduction (Ch 3) 3 lectures
- Princibles of convection (Ch 5) 4 lectures
- Forced convection (Ch 6) 9 lectures
- Natural convection (Ch 7) 1 lectures
- Radiation heat transfer (Ch 8) 1 lectures
- Condensation &Boiling heat transfer (Ch 9) 3 lectures
- Heat Exhangers (Ch 10) 8 lectures

Computer Usage: Design of heat exchangers, Solution of energy equation

Grading Policy:

Two Major Exams (20 % each)	40%
Final Exam	35%
Quizzes & Homeworks	20%
Attendence &Class participation	5%
Total	100%

Note:

1. All examinations and quizzes are open-book, close-note exams. Students should not write any solution on their books, otherwise it will be considered cheating.
2. Class attendance is essential and late attendance is not allowed.
3. Students absent 6 times will receive a warning; 9 times a grade of DN.