Content

Course Code	Course Name	Semester	Theory	Practice	Lab	Credit	ECTS
GEM132	Heat Transfer	2	2	0	0	2	2

Prerequisites	
Admission Requirements	

Language of Instruction	Turkish
Course Type	Compulsory
Course Level	Associate Degree
Objective	A student achieving a passing grade in this course will be able to do basic calculations involving heat and mass transfer as is typical for a mechanical engineer. The objectives of the course are to cover the basic principles of heat transfer, to develop an intuitive understanding of heat transfer by emphasizing the physics and physical arguments. This includes conduction, convection and radiation heat transfer as well as heat exchanger design. Students will understand the basic concepts of conduction, convection and radiation heat transfer. Students will understand how to formulate and be able to solve one and two dimensional conduction heat transfer problems. Solution techniques will include both closed form and numerical methods. Convection effects will be included as boundary conditions. Students will understand the fundamentals of the relationship between fluid flow, convection heat transfer and mass transfer. Students will apply empirical correlations for both forced and free convection to determine values for the convection heat transfer coefficient. They will then calculate heat transfer rates using the coefficients. Students will understand the basic concepts of radiation heat transfer to include both black body radiation and gray body radiation.
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References	

Theory Topics

Week	Weekly Contents
1	Introduction and Basic Concepts
2	Heat Transfer Mechanisms, Conduction, Convection, Radiation
3	General Heat Conduction Equation
4	Boundary and Initial Conditions
5	Solution of Steady One-Dimensional Heat Conduction Problems
6	Midterm Exam 1
7	Heat Generation in a solid, Variable Thermal Conductivity
8	Heat Conduction in Cylinders and Spheres
9	Lumped System Analysis
10	Transient Conduction in Semi-Infinite Solids
11	Fundamentals of Convection
12	External Forced Convection
13	Sample Problems and Solutions
14	Sample Problems and Solutions