

Content

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

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| Prerequisites | |
| Admission Requirements | |

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| Language of Instruction | Turkish |
| Course Type | Compulsory |
| Course Level | Associate Degree |
| Objective | <p>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.</p> |
| Content | |
| References | |

Theory Topics

| Week | Weekly Contents |
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| 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 |