Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering Genetics and Bioengineering Department 2024-2025 Spring Semester

Syllabus							
Code/Name	GBM 208 / HEAT AND MASS TRANSFER						
Туре	Required						
Credit/ECTS	3/3						
Hour per Week	x 3						
Level/Year	Undergraduate/2						
Semester	Spring						
Classroom	D						
Content	It covers steady-state and transient heat conduction, forced and natural convection, and heat						
	exchanger design. The course also explores radiation heat transfer and delves into mass						
	transfer principles, including Fick's laws, convective mass transfer, and applications in binary						
	mixtures.						
Prerequisites	n/a						
Textbooks	Primary						
	• Bergman T. L., Lavine A. S., Incropera F. P., DeWitt D. P. Fundamentals of Heat and Mass						
	I ransfer. John Wiley & Sons. Sixth edition						
	• Genger F. A., Ghajar A. J. Heat and Mass Transfer: Fundamentals and applications. McGraw-Hill Education. Sixth edition						
	Supplementary						
	Research article published in such library as PUBMED, ELSEVIER						
Objectives	• Develop a solid understanding of heat transfer mechanisms and apply them to analyze						
	 Understand mass transfer principles and how they relate to diffusion and convective 						
	mass transport.						
	• Model heat and mass transfer processes using differential equations and interpret the results						
	 Conduct experiments to investigate heat and mass transfer phenomena and analyze the 						
	data using appropriate methods.						
	• Design heat exchangers and optimize their performance for industrial applications.						
	Critically assess case studies and research problems related to mass and heat transfer in						
Course Outcomes	engineering.						
course outcomes	CO2. Apply mathematical models to solve heat conduction and convection problems, using						
	appropriate analytical and numerical techniques.						
	CO3. Analyze heat exchanger performance and design simple heat exchangers based on						
	thermal and hydraulic considerations.						
	CO4. Apply the principles of mass transfer to various engineering problems, including						
	unusion and convective mass transfer.						
	applications and experimental analysis.						
	CO6. Demonstrate proficiency in understanding the relationships between heat and mass						
	transfer processes, utilizing analogies to predict transfer rates.						

Weekly Schedule of Topics

W	Topic
1	Introduction to heat transfer
2	Heat transfer equipment
3	Heat transfer mechanisms (Part 1)

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4	Heat transfer mechanisms (Part 2)					
5	Heat transfer design equations					
6	Tutorials – problem solving					
7	Introduction to mass transfer					
8	General boundary problems					
9	Diffusion (Part 1)					
10	Diffusion (Part 2)					
11	Tutorials – problem solving					
12	Mass Transfer Coefficients and Convective Mass Transfer					
13	Mass Transfer in Binary Mixtures					
14	Mass Transfer Operations and Applications					
Prof	essional Contribution Be able to get knowledge about heat and mass transfer and their application areas					

Contribution to Program Outcomes*

	P01	P02	P03	P04	P05	P06	P07	P08	P09	P010	P011
C01	1	2	0	4	0	0	0	0	0	0	0
CO2	4	4	0	4	0	0	0	2	0	0	0
CO3	4	4	4	2	4	1	0	2	0	2	0
C04	4	4	0	3	3	1	0	2	0	1	0
C05	4	4	0	3	4	3	0	2	0	0	3
C06	1	2	0	2	2	1	0	0	0	0	0

* Contribution Level | 0: None | 1: Very Low | 2: Low | 3: Medium | 4: High | 5: Very High

Special Conditions	n/a					
Requirements	Knowledge of Mathematics and Physics					
Course Policy	 Students should be in the class on time. Both student and responsible lecturer should communicate in English Students should prepare themselves by reading course presentation, book and articles sent. At least 70% attendance is required, otherwise a grade of DZ will be assigned. Students must submit their essays to Turnitin assignment, otherwise students will not be graded for the group writing. 					
Cheating & Plagiarism	 Copying or letting someone copy anyone work on exams, assignments, or reports is cheating. Cutting and pasting text, figures and tables from web sources, chatGPT or any other electronic source is plagiarism. The consequence of academic dishonesty is to receive a grade of FF for the course. 					
Evaluation	Midterm Exam <u>Final exam</u> Total	40% <u>60%</u> 100%				
Rubric	n/a					
Instructor						
Name/Surname Öz	ge Güzel	Email	Ozge.guzel@alanya.edu.tr			
Room 32	1	Office Hours	Tuesday 13:30-15:30 Wednesday 13:30-15:30			

Prepared by Özge Güzel in October, 2024