Alanya Alaaddin Keykubat University | Rafet Kayış Faculty of Engineering
Mechanical Engineering Department

SYLLABUS

Code/Name	MCE 409.3 / HVAC Systems
Type	Technical Elective
Credit/ECTS	3/5
Hour per Week	3 (3+0+0)
Level/Year	Undergraduate/4
Semester	Fall
Classroom	D204
Content	Heating, ventilating and air conditioning (HVAC) principles. Classification and selection of heating, air conditioning and heat pump systems. Applied psychrometrics and air-conditioning processes. Human thermal comfort and indoor air quality. Heating and cooling loads calculations. HVAC equipment and system design. Air distribution systems and duct design.
Prerequisites	
Textbooks	***Primary*** J F Kreider, P S Curtiss, A Rabl, *Heating and Cooling of Buildings*, 2nd ed. CRC Press, 2010. ***Supplementary*** F C McQuiston, J D Parker, J D Spitler. Heating, Ventilating and Air Conditioning Analysis and Design, 6th ed. Wiley, 2004.
Objectives	• To provide an overview of heating and cooling systems • To analyze air conditioning processes • To calculate heating and cooling loads of buildings
Course Outcomes	In this course you will be able to: CO1 Illustrate main characteristics of heating and cooling equipment CO2 Describe principles of heating, ventilating and air conditioning systems CO3 Apply mass and energy balances to various air conditioning processes CO4 Assess the parameters of human thermal comfort and indoor air quality CO5 Calculate heating and cooling loads of buildings C06 Calculate energy consumption in buildings

Weekly Schedule of Topics

W	Topic
1	Human body and thermal comfort
2	Design conditions for heating and cooling
3	Heating load calculations
4	Cooling load calculations
5	Solar heat gain through windows
6	Heat transfer through windows
7	Infiltration heat load
8	Annual energy consumption
9	Moist air properties
10	Adiabatic saturation and wet bulb temperatures
11	Psychrometric chart
12	Pschrometric processes, heating and cooling
13	Humidification, dehumidifaction, mixing and cooling towers

14	HVAC equipment and duct design

Professional Contribution	Ability to understand, select, analyze, and improve HVAC systems

Contribution to Program Outcomes*

	PO1	PO2	PO3	PO4	PO5	PO6	PO7	PO8	PO9	PO10	PO11
CO1	0	0	0	0	0	0	3	1	0	0	0
CO2	0	0	0	0	0	0	3	1	0	0	0
CO3	5	0	0	0	0	0	0	0	0	4	0
CO4	2	4	0	2	0	0	5	0	0	3	0
CO5	5	2	0	5	5	0	3	3	5	4	3
CO6	5	2	0	5	5	0	3	3	5	4	3

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

Special Conditions	• Students work in groups for project and presentations.
Requirements	NA
Evaluation	Midterm Exam 40% Quiz, Assignment 20% Final Exam 40% Total 100%
Rubric	NA
Course Policy	1. Students are required to attend at least 70% of the theoretical courses and 80% of the courses with lab/application sessions including add-drop period. Otherwise, you will receive a grade of DZ. Health reports and other official or nonofficial excuses are not accepted. 2. Be in the class on time. Late attendance may result in grade deductions. 3. English should always be used to communicate with one another. 4. Mobile phone should be switched off and put away during the class. 5. Illegal copies of the textbooks and other illegal course materials cannot be used for the classwork and exams.
Cheating & Plagiarism	• Copying or letting someone to copy your work on exams, assignments, or reports is cheating. • Cutting and pasting text, figures and tables from the web sources or any other electronic source is plagiarism. • A consequence of academic dishonesty is to receive a grade of FF for the course.

Instructor

Name/Surname	Mehmet Kanoglu	Email	mehmet.kanoglu@alanya.edu.tr
Room	228	Office Hours	

Prepared by Mehmet Kanoğlu