Identification	**Subject**	CHEM 215 Introduction to Chemical Engineering 6 ECTS	
	Department	Chemistry and Chemical Engineering	
	Program	Undergraduate	
	Term	Fall 2024	
	Instructor	Shahin Orujov	
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	Phone		
	Classroom/hours	TBC	
	Office hours		
Prerequisites			
Language	English		
Compulsory/Elective	Compulsory		
Required textbooks and course materials	1. Principles of Chemical Engineering Processes, Nayef Ghasem and Redhouane Henda, 2nd edition, 2015 2. Elementary Principles of Chemical Processes by Richard M. Felder and Ronald W. Rousseau, 4th edition, 2016 3. Chemical Engineering: An Introduction by Morton M. Denn, 2013 4. Transport Processes and Separation Process Principles by Christie J. Geankoplis (Published 2018, 5th Edition) 5. Introduction to Chemical Engineering Thermodynamics by J.M. Smith, H.C. Van Ness, and M.M. Abbott (Published 2005, 7th Edition) 6. Fundamentals of Heat and Mass Transfer by Frank P. Incropera and David P. DeWitt (Published 2017, 7th Edition) 7. Separation Process Principles by Ernest J. Henley, J. D. Seader, and D. F. Roper (Published 2011, 2nd Edition) 8. Chemical Process Design and Integration by Robin Smith (Published 2005) 9. Chemical Process Safety: A Mathematical Approach by Daniel A. Crowl and Joseph F. Louvar (Published 2011, 3rd Edition) 10. Chemical Engineering Design by Gavin Towler and Ray Sinnott (Published 2013, 2nd Edition)		
Website of course	This course is based on traditional face-to-face classes.		
Teaching methods	**Lecture**	**X**	
	Group discussion	**X**	
	Practical tasks	**X**	

Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Activity		5
	Quiz	TBC	15
	Midterm Exam	TBC	30
	Presentation/Group work	15th week	10
	Final Exam	TBC	40
	Total		100

Course outline	This Introduction to Chemical Engineering course provides a comprehensive overview of key concepts and practices in the field. Students begin with a review of basic chemistry and an introduction to chemical engineering principles. They then explore material and energy balances, foundational fluid mechanics, and the basics of chemical thermodynamics. The course includes a midterm exam to assess understanding before delving into heat transfer fundamentals and separation processes. Students also learn about chemical process design, emphasizing safety, environmental awareness, and real-world applications. The course culminates in a project presentation where students apply their knowledge to a practical problem, demonstrating their grasp of chemical engineering principles.
Course objectives	• General Objective of the Course: To meet curriculum requirements of the School of Engineering and Applied Sciences (SEAS). • Specific Objectives of the Course: To provide students with foundational knowledge in key topics such as material and energy balances, fluid mechanics, and thermodynamics, while emphasizing safety and environmental awareness. By integrating theory and practical applications, the course prepares students for advanced studies and real-world challenges in chemical engineering.
Learning outcomes	By the end of the course the students should be able: • Apply fundamental principles of material and energy balances to analyze and solve problems in chemical processes. • Utilize basic concepts of fluid mechanics and thermodynamics to assess and design chemical engineering systems. • Implement heat transfer and separation techniques effectively in process design and analysis. Demonstrate safety and environmental awareness in the context of chemical engineering practices and communicate project findings clearly and professionally.

Policy	• **Participation** For a variety of reasons, participation in a classroom context is essential. It is essential to the learning process, promotes teamwork, and aids in the general success of both the individual students and the class as a whole. • **Presentation/Group work** Students will participate in group projects that culminate in presentations, where they will collaboratively explore and present key concepts in chemical engineering. This activity is designed to enhance teamwork and communication skills while encouraging critical analysis of engineering principles. Through this process, students will deepen their understanding of the subject matter and learn to effectively convey complex information to their peers. • **Activity** Students will actively participate in class activities, which may include discussions, group work, and hands-on problem-solving exercises. Contributions to these activities will be evaluated based on engagement, collaboration, and the application of chemical engineering concepts. Additionally, successful completion of group presentations and projects will also contribute to their overall assessment, reinforcing both understanding and communication skills. • **Quiz** A consistent method of gauging your understanding of the content covered in class is through quizzes. They assist you and your teacher in evaluating your comprehension of important ideas and identifying any areas that can benefit from more explanation. Each quiz will consist of 3-5 questions, and each quiz will be marked with 5 point. There will be three quizzes. • **Withdrawal (pass/fail)** The School Science and Engineering grading guidelines are carefully adhered to throughout this course. To pass, a student must typically receive a markof at least 60%. If the student fails, the course. • **Cheating/plagiarism** Any form of plagiarism or cheating on a test, quiz, or project will result in the cancellation of the assignment. In this scenario, the student will receive a scoreof zero (zero) without any further consideration. • **Illness** Student with an illness may miss a quiz or presentation. This might be because the student needs to go to the hospital, recover at home, or attend regular medical appointments. In this case, the student must inform the instructor in advance about the illness and must present a document from their doctor. After considering the situation, the instructor may set a new date for the quiz or project presentation. Only one opportunity will be given to the student. The students who don't inform the instructor in advance will not be given a chance to retake the quiz or give a presentation. • **Professional behavior guidelines** During class hours, students are expected to conduct themselves in a way that fosters a positive academic and professional atmosphere. Discussions without permission and unethical conduct are absolutely forbidden. • **Ethics** In class, students must not be late. During class, mobile phones must be put away and turned off.

Tentative Schedule		
Weeks	**Topics**	**Reference books**
1	Introduction to Chemical Engineering & Basic Chemistry Review	[2] Chapter 1 and 2

2-3	Material and Energy Balances	[1] Chapter 2 [3] Chapter 3 and 4
4-5	Fluid Mechanics Basics	[1] Chapter 5 [4] Chapter 1,2 and 3
6-7	Introduction to Chemical Thermodynamics	[5] Chapter 1 and 2
8	**Midterm exam**	
9-10	Heat Transfer Fundamentals	[6] Chapter 1,2,3 and 4
11	Introduction to separation processes	[1] Chapter 1,2,3 [7] Chapter 6
12	Introduction to Chemical Process Design	[1] Chapter 10 [8] Chapter 1 and 2
13	Safety and Environmental Awareness	[9] Chapter 1,2 and 3
14	Chemical Engineering Applications	[1] Chapter 12 [10] Chapter 1 and 2
15	Project Presentation	
Final Exam		