Identification	**Subject**	Complex analysis, MATH 317, 6 ECTS
	Department	Mathematics
	Program	Undergraduate
	Term	Spring, 2024
	Instructor	Atamova Lala
	E-mail:	ljafarova@khazar.org
	Phone:	(+994) 50-324-15-56
	Classroom/hours	Tuesday:11:50-13:20 Thursday: 11:50-13:20
Prerequisites	MATH 105	
Language	English	
Compulsory/Elective	Required	
Required textbooks and course materials	**Core Textbooks:** **1.** James Ward Brown, Ruel v. Churchill. Complex variables and applications, 7-th edition. **2.** M.L.Krasnov, A.I.Kiselev, G.I.Makarenko. Functions of complex variable, Operational Calculus, and Stability Theory. Problems and exercises, 1984 **Supplementary book** 1. John H. Mathews, Russell W. Howell, Complex analysis for mathematics and engineering, Third edition.	
Course website		
Course outline	Complex Analysis is a major course at School of Science and Engineering of Khazar University; it plays a role in the understanding of science, engineering, economics, and computer science, among other disciplines. This is an introductory course to Complex Analysis at an undergraduate level. Complex Analysis, in a nutshell, is the theory of differentiation and integration of functions with complex-valued arguments $z = x + \boldsymbol{i}\, y$, where $\boldsymbol{i} = (-1)^{1/2}$. While the course will try to include rigorous proofs for many - but not all - of the material covered, emphasize will be placed on applications and examples. Complex Analysis is a topic that is extremely useful in many applied topics such as numerical analysis, electrical engineering, physics, chaos theory, and much more, and you will see some of these applications throughout the course. In addition, complex analysis is a subject that is, in a sense, very complete.	
Course objectives	Functions of complex variable, limit of functions of complex variable, derivative of Functions of complex variable, Cauchy-Riemann Equations	
Teaching methods	**Lecture**	x
	Group discussion	x
	Experiential exercise	x

	Simulation		
	Case analysis		
	Course paper		x
	Others		
Evaluation	**Methods**	**Date/deadlines**	**Percentage (%)**
	Midterm Exam		30
	Case studies		
	Class Participation		5
	Quizzes		20(2 quizzes)
	Activity		5
	Project		
	Laboratory work		
	Final Exam		40
	Others		
	Total		100

Policy

- **Preparation for class**

The structure of this course makes your individual study and preparation outside the class extremely important. The lecture material will focus on the major points introduced in the text. Reading the assigned chapters and having some familiarity with them before class will greatly assist your understanding of the lecture. After the lecture, you should study your notes and work relevant problems and cases from the end of the chapter and sample exam questions.Throughout the semester we will also have a large number of review sessions. These review sessions will take place during the regularly scheduled class periods.

- **Attendance**

Students who do not attend more than 25% of classes will not be allowed to take the exam.

- **Quizzes and examinations**

Quizzes may be given unannounced throughout the term. There will be no make-up quizzes.

- **Withdrawal (pass/fail)**

This course strictly follows grading policy of the School of Science and Engineering. Thus, a student is normally expected to achieve a mark of at least 60% to pass. In case of failure, he/she will be required to repeat the course the following term or year.

- **Cheating/plagiarism**

Cheating or other plagiarism during the Quizzes, Mid-term and Final Examinations will lead to paper cancellation. In this case, the student will automatically get zero (0), without any considerations.

- **Professional behavior guidelines**

The students shall behave in the way to create favorable academic and professional environment during the class hours. Unauthorized discussions and unethical behavior are strictly prohibited.

- **Ethic**

Use of any electronic devices is prohibited in the classroom. All devices should be turned off before entering class. This is a university policy and violators will be reprimanded accordingly!

Students should not arrive in late to class!

Tentative Schedule

Week	Date/Day (tentative)	Topics	Textbook/ Assignments
1	13.02.24 15.02.24	Complex numbers: Sums and Products. Basic algebraic properties. Further properties. Moduli. Complex Conjugates. Exponential Form.	[1] p. 1-15
2	20.02.24 22.02.24	Products and quotients in exponential form. Roots of complex numbers. Examples Regions in the Complex Plane	[1] p. 15-32
3	27.02.24 29.02.24	Functions of a complex variable. Mappings. Mappings by the exponential function. Limits. Theorems on limits. Limits involving the point at infinity.	[1] p. 33-43 [1] p. 43-51
4	05.03.24 07.03.24	Continuity. Derivatives, Differentiation formulas.	[1] p. 51-54 [1] p. 54-60
5	12.03.24 14.03.24	Cauchy-Riemann Equations, Sufficient conditions for differentiability, Polar coordinates. Analytic Functions	[1] p. 60-72

6	19.03.24 21.03.24	Harmonic Functions Novruz Holiday	[1] p. 75-80
7	26.03.24 28.03.24	The exponential function The Logarithmic function. Branches and derivatives of logarithms. Some identities involving logarithms.	[1] p. 87-90 [1] p. 90-97
8	02.04.24 04.04.24	Complex Exponents Problem Solving	[1] p. 97-100
9	 09.04.24 **11.04.24**	Trigs **Ramadan Holiday**	[1] p. 100-105
10	16.04.24 18.04.24	Hyperbolic Functions. Inverse trigonometric and hyperbolic functions. Solving problems	[1] p. 105-110
11	23.04.24 25.04.24	Convergence of Sequences. Convergence of Series. Taylor Series. Examples.	[1] p. 175-190
12	30.04.24 04.05.24	Laurent Series. Examples. Absolute and Uniform Convergence of Power Series. Continuity of Sums of Power Series.	[1] p. 190-206
13	07.05.24 **09.05.24**	Integration and Differentiation of Power Series. Problem Solving **Holiday**	[1] p. 206-210
14	14.05.24 16.05.24	Uniqueness of Series Representation Problem Solving	[1] p. 210-215
15	21.05.24 24.15.24	Multiplication and Division of Power Series Problem Solving	[1] p. 215-221
	TBA	**FINAL EXAM**	

This syllabus is a guide for the course and any modifications to it will be announced in advance.