

Identification	Subject	MATH 317, Complex analysis, 6 ECTS	
	Department	Mathematics	
	Program	Undergraduate	
	Term	Fall, 2024	
	Instructor	Ali Huseynli	
	E-mail:	ahuseynli@khazar.org	
	Classroom/hours	Monday: 13:40 – 15:10, Thursday: 10:10 - 11:40	
Prerequisites	MATH 105		
Language	English		
Compulsory/Elective	Required		
Required textbooks and course materials	<p>Core Textbooks:</p> <ol style="list-style-type: none"> 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 <p>Supplementary book</p> <ol style="list-style-type: none"> 1. John H. Mathews, Russell W. Howell, Complex analysis for mathematics and engineering, Third edition. 		
Course website			
Course outline	<p>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 $z = x + i y$, where $i = (-1)^{1/2}$. 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.</p>		
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	
	Course paper	x	
Evaluation	Methods	Date/deadlines	Percentage (%)
	Midterm Exam		30
	Class Participation		5
	Quizzes		20 (2 quizzes)

	Activity		5
	Final Exam		40
	Total		100
Policy	<ul style="list-style-type: none"> ▪ 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 <u>violators will be reprimanded accordingly!</u> Students should not arrive in late to class! 		

Tentative Schedule			
Week	Date/Day (tentative)	Topics	Textbook/ Assignments
1	16.09.2023 19.09.2023	Complex numbers: Sums and Products. Basic algebraic properties. Further properties. Moduli. Complex Conjugates. Exponential Form.	[1] p. 1-15
2	23.09.2023 26.09.2023	Products and quotients in exponential form. Roots of complex numbers. Examples Regions in the Complex Plane	[1] p. 15-32
3	30.09.2023 03.10.2023	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	07.10.2023 10.10.2023	Continuity. Derivatives, Differentiation formulas.	[1] p. 51-54 [1] p. 54-60
5	14.10.2023 17.10.2023	Cauchy-Riemann Equations, Sufficient conditions for differentiability, Polar coordinates. Analytic Functions	[1] p. 60-72
6	21.10.2023 24.10.2023	Harmonic Functions Novruz Holiday	[1] p. 75-80
7	28.10.2023 31.10.2023	The exponential function The Logarithmic function. Branches and derivatives of logarithms. Some identities involving logarithms.	[1] p. 87-90 [1] p. 90-97
8	04.11.2023 07.11.2023	Complex Exponents Problem Solving	[1] p. 97-100
9	11.11.2023 14.11.2023	Trigs Ramadan Holiday	[1] p. 100-105
10	18.11.2023 21.11.2023	Hyperbolic Functions. Inverse trigonometric and hyperbolic functions. Solving problems	[1] p. 105-110
11	25.11.2023 28.11.2023	Convergence of Sequences. Convergence of Series. Taylor Series. Examples.	[1] p. 175-190
12	02.12.2023 05.12.2023	Laurent Series. Examples. Absolute and Uniform Convergence of Power Series. Continuity of Sums of Power Series.	[1] p. 190-206

13	09.12.2023 12.12.2023	Integration and Differentiation of Power Series. Problem Solving Holiday	[1] p. 206-210
14	16.12.2023 19.12.2023	Uniqueness of Series Representation Problem Solving	[1] p. 210-215
15	23.12.2023 26.12.2023	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.