



CHET TILINI BILISH DARAJASI TO'G'RIDA

SERTIFIKAT  
CERTIFICATE

OF FOREIGN LANGUAGE PROFICIENCY

Sertifikat № | Reference Number

22DTM1020282RM

Talabgor to'g'risidagi ma'lumot | Candidate Details

Shaxsni tasdiqlovchi  
hujjat seriyasi va raqami | ID series and number:

AA 9683408

Familiyasi | Surname

RAUPOVA

Ismi | First Name

MOHINUR

Otasining ismi | Patronymic Name:

HAYDAR QIZI



Chet tili |  
Foreign Language

INGLIZ TILI

Daraja |  
Level

B2

Test sinovi  
natijalari |  
Test Results

Tinglab tushunish |  
Listening

69

O'qish |  
Reading

55

Umumiy ball |  
Overall Score:

60

Yozish |  
Writing

57

Gapirish |  
Speaking

60

Berilgan sanasi |  
Date of Issue:

15.11.2022

Amal qilish muddati |  
Valid until:

14.11.2024

Direktor |  
Director

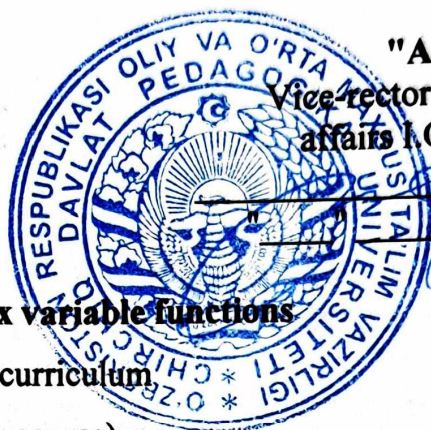


M.KARIMOV



**MINISTRY OF HIGHER AND SECONDARY SPECIALISED EDUCATION  
OF THE REPUBLIC OF UZBEKISTAN**

**CHIRCHIQ STATE PEDAGOGICAL UNIVERSITY**



**"APPROVED"**

Vice-rector for academic  
affairs I.Q. Khaydarov

2022 y

**Theory of complex variable functions**  
working curriculum  
(junior course)

Field of knowledge: 100000 - Humanitarian  
Field of education: 110000 - Pedagogy  
Direction of education: 5110100 – Mathematics and informatics

Type of training	Allocated hours	Semester
		V
Theory (lecture)	30	30
Practical	30	30
Independent education	60	60
Total allocated hours	60	60
Total study hours	120	120

Working program of the discipline of the ministry of higher and secondary specialised education of the republic of uzbekistan "\_\_\_" \_\_\_\_\_ 2020 year prepared for the basics of the discipline "mathematical analysis", approved by the program № \_\_\_\_y.

The working curriculum of the discipline was approved by the decision of the Council of the Chirchik State Pedagogical University dated "\_\_\_" \_\_\_\_\_ 2022 year.

**Authors:**

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mathematical sciences.

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The working curriculum of the subject was discussed at the meeting of the "Mathematics and Informatics" faculty of Chirchik State Pedagogical University in 2022, on \_\_\_\_.

Faculty dean



A.R. Qutlimurotov

The working curriculum of the subject of the "Mathematics" department of the "Mathematics and Informatics" faculty of Chirchik State Pedagogical University was considered and recommended for approval at the meeting numbered \_\_\_\_ in \_\_\_\_.

The head of the department



E.M. Makhkamov





## CURRICULUM (SYLLABUS)

**Mathematics and Informatics  
faculty**

**60110600 – Mathematics and  
Informatics education**

General information		
<b>Subject name:</b> Theory of complex variable functions		
<b>Science code:</b> Math 2146	<b>Amount of credit:</b> 4	<b>Semester:</b> 5
<b>Department name:</b> Algebra and mathematical analysis		
<b>Science teacher:</b> Raupova Mokhinur Khaydar kizi		
<b>Email:</b> r.mokhinur@gmail.com		
<b>Subject Type:</b> Compulsory		
<b>Form of education:</b>	Full-time	
<b>Evaluation form:</b>	Examination	
<b>Science language:</b>	Uzbek	

Summary of science
<p>The purpose of the subject " Theory of complex variable functions" is to study the basic concepts of arithmetic from the point of view of the fundamental ideas inherent in them, to help in the formation of special professional competence of students in the field of arithmetic, to use the knowledge and experience gained as a result of studying the science in professional activities is the formation of readiness to use skills.</p>

Education results:
<p><b>Students who completed the course:</b></p> <ul style="list-style-type: none"> <li>• Demonstrates a deep understanding of concepts and principles of Theory of complex variable functions;</li> <li>• Deeply analyzes the essence of complex examples and methods of solving problems related to elementary mathematics;</li> <li>• Knows how to use appropriate elementary mathematics tools to solve problems in professional activities;</li> </ul> <p><b>Competencies to be acquired as a result of the course:</b></p> <ul style="list-style-type: none"> <li>• In the future professional activity, he will acquire knowledge, skills and abilities in the fields of elementary mathematics, mathematical analysis, algebra and number theory, geometry, differential equations, probability theory (KK-1);</li> <li>• Participates in the implementation of scientific-research works (KK-3).</li> </ul>



Science content	
Form of training: lecture (M)	
<b>M1</b>	Operations on complex numbers.
<b>M2</b>	Field in complex plane, sequence of complex numbers and their limit.
<b>M3</b>	Concept of complex variable function. Limit and continuity of a complex variable function.
<b>M4</b>	Elementary functions and their conformal representations.
<b>M5</b>	Laplace transform and its properties.
<b>M6</b>	Differentiability of a complex variable function.
<b>M7</b>	Integral of a complex variable function. Cauchy's integral theorem. Cauchy's integral formula.
	<b>1<sup>st</sup> summative</b>
<b>M8</b>	Taylor series. Classification of special points.
<b>M9</b>	Functional series, degree series and Laurent series, deductions
<b>M10</b>	Jordan's lemma.
<b>M11</b>	Calculating integrals using deductions.
<b>M12</b>	A regular branch of a logarithm.
<b>M13</b>	A regular branch of roots.
<b>M14</b>	Rush's theorem, Integer functions.
<b>M15</b>	Meromorphic functions and their properties.
Form of training: practical training (A)	
<b>A1</b>	Operations on complex numbers.
<b>A2</b>	Field in complex plane, sequence of complex numbers and their limit.
<b>A3</b>	Concept of complex variable function. Limit and continuity of a complex variable function.
<b>A4</b>	Elementary functions and their conformal representations.
<b>A5</b>	Laplace transform and its properties.
<b>A6</b>	Differentiability of a complex variable function.
<b>A7</b>	Integral of a complex variable function. Cauchy's integral theorem. Cauchy's integral formula.
	<b>1<sup>st</sup> summative</b>
<b>A8</b>	Taylor series. Classification of special points.
<b>A9</b>	Functional series, degree series and Laurent series, deductions
<b>A10</b>	Jordan's lemma.
<b>A11</b>	Calculating integrals using deductions.
<b>A12</b>	A regular branch of a logarithm.
<b>A13</b>	A regular branch of roots.
<b>A14</b>	Rush's theorem, Integer functions.
<b>A15</b>	Meromorphic functions and their properties.



### **Teaching and learning methods**

The module is organized through lectures and practical classroom training, as well as independent educational activities of students. Lectures provide theoretical information necessary for analyzing the topics of the mathematical analysis course. In practical classroom sessions, mathematical analysis course problems (examples and problems) are presented, and students are given the opportunity to practice applying the necessary mathematical methods and techniques to solve them. In independent educational activities, students should study the topics in depth and analyze the topics using literature and scientific journals and sources..

Type of training	Allocated hours
Lecture	30
Practical training	30
Independent hours	60
Total hours of study and teaching of students	120

#### **Criteria for evaluation and control of student knowledge in science**

Monitoring and evaluation of students' knowledge is carried out through student activity, mid-term control, final control, and assessment of independent education.

- Midterm control is an important stage of assessment by the professor-teacher of the student's knowledge and practical skills acquired in the first part of the module, and is an indicator of future mastery of this subject. Assessment of students' knowledge in mid-term control is carried out through oral question-and-answer and written work. If the student does not pass the mid-term examination, he will be given the opportunity to retake it 2 more times. 20 percent of the total evaluation.

- Assessment of independent education - it is carried out by the students' performance of practical projects in a collective order and individually. Each student is given one team project and two individual projects. The student studies and conducts research on the given issue, understanding the goals and objectives of the assigned project. Analyzes the obtained results, prepares presentations with conclusions and defends them. The number, subject, content of the projects, methods of implementation and deadlines are fully disclosed in the working science program. 50 percent of the total evaluation.

- Final control is a summative stage of evaluation of knowledge and practical skills of the student by the professor-teacher. Final control is conducted in the form of a written work. 30 percent of the total evaluation.

Assessment, intermediate and final control tasks (tasks) are developed by the course professors, pre-moderated and approved by the head of the department.

The content of the assignments for the control types should allow for an objective, transparent and accurate assessment of the student's learning.

A student must not engage in any activity that may lead to academic misconduct. For example, plagiarism, collusion, falsification of results, violations



during the examination process, i.e. use of notes and handouts, telephone and other means of communication, communication with others inside or outside the examination room are prohibited. Students who are guilty of this will be removed from the control or examination process, and their grade will be zero.

Depending on the characteristics of the subject (course), changes and additions may be made to the evaluation and control criteria.

Basic literature	
1.	Shabat B.V. Introduction to complex analysis. T. 1, M. Science, 1985
2.	Khudaiberganov G., Vorisov A.K., Mansurov Kh.T., Complex analysis. T. University 1998.
3.	Sadullayev A., Khudoyberganov G., Mansurov X., Vorisov A., Tuychiyev T. Collection of examples and problems from the course of mathematical analysis (complex analysis) 3 parts. "Uzbekistan" 2000
Additional literature	
1.	Sirajiddinov S.Kh., Salokhitdinov M.S., Maksudov Sh. Theory of functions of a complex variable. T. "Teacher" 1979.
2.	Privalov I.I. Introduction to the theory and function of the complex variable. M. "Nauka" 1977.
3.	Sidorov Yu.V., Fedoryuk I.V., Shabunin M.I. lectures of TFKP.M, Nauka. 1984.

#### Internet sites

1. [www.pedagog.uz](http://www.pedagog.uz)
2. [www.edu.uz](http://www.edu.uz)
3. <http://ziyonet.uz>
4. [www.cspi.uz](http://www.cspi.uz)