O‘ZBEKISTON RESPUBLIKASI
VAZIRLAR MAHKAMASI HUZURIDAGI
DAVLAT TEST MARKAZI

STATE TEST CENTER UNDER THE
CABINET OF MINISTERS OF THE
REPUBLIC OF UZBEKISTAN

CHET TILINI BILISH DARAJASI TO‘G‘RISIDA

SERTIFIKAT
CERTIFICATE

OF FOREIGN LANGUAGE PROFICIENCY

Sertifikat № | Reference Number: **22DTM1014187IF**

Talabgor to‘g‘risidagi ma’lumot | Candidate Details

Shaxsni tasdiqlovchi hujjat seriyasi va raqami | ID series and number: **AA 8779876**

Familiyasi | Surname: **ISRAILOVA**

Ismi | First Name: **FERUZA**

Otasining ismi | Patronymic Name: **AKBAR QIZI**

Chet tili | Foreign Language: **INGLIZ TILI**

Daraja | Level: **B2**

Test sinovi natijalari | Test Results

Tinglab tushunish | Listening	51	O‘qish | Reading	48	Umumiy ball | Overall Score: 51
Yozish | Writing	47	Gapirish | Speaking	56	

Berilgan sanasi | Date of Issue: **05.07.2022**

Amal qilish muddati | Valid until: **04.07.2024**

Direktor | Director

M.KARIMOV

MINISTRY OF HIGHER EDUCATION, SCIENCE AND INNOVATION OF THE REPUBLIC OF UZBEKISTAN
CHIRCHIK STATE PEDAGOGICAL UNIVERSITY

"Approved by"
Rector of Chirchik State
Pedagogical University
G.I.Mukhamedov
2023 year "29" 08

CURRICULUM (SYLLABUS)

OF DIFFERENTIAL EQUATIONS.

(2nd full-time course)

Field of knowledge:	100000 – Education
Field of study:	110000 – Education
Areas of study:	60110600 - Mathematics and informatics

Chirchik - 2023

The curriculum (syllabus) of the subject was approved by the Council of Chirchik State Pedagogical University dated "29" 08 2023, of the meeting of No. 1

Authors:

B.Z.Usmonov — Senior teacher at the Department of "Methodology of Teaching Mathematics and Geometry", Faculty of "Mathematics and Informatics", Chirchik State Pedagogical University.

Q.Q.Taliboyeva — Teacher at the Department of "Methodology of Teaching Mathematics and Geometry", Faculty of "Mathematics and Informatics", Chirchik State Pedagogical University

Reviewers :

B.Sh.Radjabov — Professor of the Department of "Methodology of Teaching Mathematics and Geometry" of the Faculty of "Mathematics and Informatics" of Chirchik State Pedagogical University

The curriculum (syllabus) of the subject was approved and recommended to the council of the faculty "Mathematics and informatics" at a meeting of the department "Methodology of teaching mathematics and geometry" by protocol No. 1 of "28.08" 2023

The head of the department **D.M .Makhmudova**

The curriculum (syllabus) of the subject was discussed and recommended for use by the faculty council of the Faculty of Mathematics and Informatics of Chirchik State Pedagogical University from "28" 08 2023, protocol No1

The dean of the university **D.M. Makhmudova**

CURRICULUM (SYLLABUS)

Mathematics and Informatics Faculty

60110600 – Mathematics and Informatics

General information		
Subject name: Differential equations		
Subject code: Math 3116	**Amount of credit: 6**	**Semester:** 3
Department name: Methodology of Teaching Mathematics and Geometry		
Teacher: Makhmudova Dilfuza Meliyevna		
Email: dilfuzamahmudova@mail.ru		
Subject Type: Compulsory		
Form of education:	Full-time	
Evaluation form:	Exam	
Science language:	English	

Summary of science

The main content of the course on differential equations for students. Basic concepts about differential equations. Differential equations with separated and reduced variables. Homogeneous equations with respect to their variables. Gain an overview of linear differential equations, Bernoulli and Riccati equations, complete differential equations, unsolved first order equations with respect to derivatives, higher order differential equations, systems of differential equations, boundary value problems for linear equations and first order partial differential equations and this consists of studying the application of examples and tasks related to the topics.

Learning outcomes:

Students who completed the course:

- Demonstrates a thorough understanding of differential equation concepts and principles;
- Deeply analyzes the essence of differential equation methods;
- Can use appropriate differential equation tools to solve professional problems.

Competencies to be acquired as a result of the course:

- Acquires knowledge, skills and abilities in the field of algebra in future professional activities;
- Participates in the implementation of research work.

Science content	
Form of education: Lecture (L)	
L1	Basic information about differential equations. Problems leading to differential equations.
L2	Differential equations with separable variables
L3	Homogeneous differential equation
L4	Linear differential equation
L5	Bernoulli and Riccati equations.
L6	Equations in total differentials. Integrating factor
L7	Unsolved first order equations with respect to the derivative.
L8	General method for entering a parameter. Lagrange and Clairaut equations.
L9	Existence and uniqueness of the solution of the Cauchy problem for an unsolved first-order ordinary differential equation with respect to the derivative. Special solution
L10	Theorem of existence and uniqueness of ordinary differential equations of the nth order. Reduction of order in differential equations. Nonlinear integrable equations
L11	Linear differential equations of the nth order. Vronsky's determinant. Ostrogradsky-Liouville formula
	1st summative
L12	Linear differential equations of the nth order. Vronsky's determinant. Ostrogradsky-Liouville formula
L13	Linear differential equations of the nth order. Lagrange method
L14	Linear homogeneous differential equation of nth order with constant coefficients
L15	Linear inhomogeneous differential equation with constant coefficients of the nth order and their properties. Lagrange's method of variation of arbitrary invariants.
L16	Equations leading to a linear equation with constant coefficients
L17	Hybrid equation, Euler equation
L18	System of differential equations. Normal system of differential equations. General concepts
L19	Methods for solving a system of linear differential equations with constant coefficients
L20	Methods for solving a system of linear differential equations with constant coefficients
L21	Basics of Stagnation Theory
L22	First order partial differential equations.
	Final control
Form of education: practical lesson (P)	
P1	Basic information about differential equations. Problems leading to

	differential equations.
P2	Differential equations with separable variables
P3	Homogeneous differential equation
P4	Linear differential equation
P5	Bernoulli and Riccati equations.
P6	Equations in total differentials. Integrating factor
P7	Unsolved first order equations with respect to the derivative.
P8	General method for entering a parameter. Lagrange and Clairaut equations.
P9	Existence and uniqueness of the solution of the Cauchy problem for an unsolved first-order ordinary differential equation with respect to the derivative. Special solution
P10	Theorem of existence and uniqueness of ordinary differential equations of the nth order. Reduction of order in differential equations. Nonlinear integrable equations
P11	Linear differential equations of the nth order. Vronsky's determinant. Ostrogradsky-Liouville formula
P12	Linear differential equations of the nth order. Vronsky's determinant. Ostrogradsky-Liouville formula
P13	Linear differential equations of the nth order. Lagrange method
P14	Linear homogeneous differential equation of nth order with constant coefficients
P15	Linear inhomogeneous differential equation with constant coefficients of the nth order and their properties. Lagrange's method of variation of arbitrary invariants.
P16	Equations leading to a linear equation with constant coefficients
P17	Hybrid equation, Euler equation
P18	System of differential equations. Normal system of differential equations. General concepts
P19	Methods for solving a system of linear differential equations with constant coefficients
P20	Methods for solving a system of linear differential equations with constant coefficients
P21	Basics of Stagnation Theory
P22	First order partial differential equations.
P23	First order partial differential equations.

Teaching and learning methods

It is organized through lectures and practical classroom training as well as independent learning activities of students. Lectures provide theoretical information necessary for the analysis of the topics of the elementary mathematics (arithmetic) course. In practical classroom sessions, problems (examples and problems) of the Elementary Mathematics (arithmetic) course are presented and students are given the opportunity to practice applying the necessary mathematical methods and techniques

to solve them. In independent learning activities, students should study the topics in depth and analyze the topics using literature and scientific journals and sources.

Type of training	A dedicated hour
Lecture	44
Practical training	46
Independent education	90
Total student hours of study and teaching	180

Criteria for assessment and control of student knowledge in science

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

- **Mid-term supervision** is an important stage of assessment by the 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 assessment.**
- **Assessment of independent learning** is carried out through students' completion of assigned practical projects in a group and individually. Each student is given one team project and two individual projects. The student studies the given issue and conducts research, understanding the goals and objectives of the given 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 the student's knowledge and practical skills by the professor-teacher . Final control is conducted in the form of 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 conducting the types of control should allow 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 (misconduct). For example, plagiarism, collusion, falsification of results, irregularities in 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 excluded 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.	Saloxiddinov M.S., Nasriddinov G. Oddiy differensial tenglamalar. Toshkent.O'qituvchi. 1994.
2.	Jo'raev T. va boshq. Oliy matematika asoslari. 2-qism. T. «O'zbekiston», 1999, 304 b.
3.	Флиппов А.Ф. Сборник задач по дифференциалнқм уравнениям. Ижевск: Изд-во РХД.2000.175 с.
4.	Turgunbayev R., Ismailov Sh, Abdullayev O., "Differensial tenglamalar kursidan misol va masalalar to'plami". T.: TDPU. 2007
Recommended additional reading	
1.	Елголс Л.Е. Дифференциалные уравнения и вариатсионные исчисление. М.Дом Книга. УРСС. 2006.312 с
2.	Morris Tenebout, Harry Pollard. Ordinary Differential Equations, Birkhhauzer. Germane, 2010.
3.	Степанов В.В. Курс дифференциалных уравнений . М., Дом Книга. УРСС. 2006.472 с.
4.	Oppoqov Y. P. va bosh. Oddiy differensial tenglamalardan misol va masalalar to'plami. T.:Yangi avlod. 2006.
5.	Gusak A.A. Matematicheskiy analiz i дифференциалние уравнения. М.: "Тетра системс" . 1998 г.
6.	Ернестович Е.А. Дифференциалные уравнения. М.:Дом Книга. 2006 г.

Internet addresses

1. www.pedagog.uz
2. www.edu.uz
3. http://ziyonet.uz
4. www.Geometry-for-elementary-school.com
5. exponenta.ru
6. math.com
7. www.mathedu.com
8. www.cspi.uz