The list of academic disciplines of the university component

6B01 - Pedagogical sciences
(Code and classification of the field of education)

6B015 - Teacher training in natural science subjects
(Code and classification of the direction of training)

0114
(Code in the International Standard Classification of Education)

B009 - Math teacher training
(Code and classification of the educational program group)

6B01501 - Mathematics
(Code and name of the educational program)

bachelor
(Level of preparation)

set of 2023

Semey 2023

Developed
Academic Committee of the OP
Head of JSC Mukayev Zh.T.
Manager OP Taiboldina K.R.

Reviewed
At the meeting of the Quality Assurance Commission
Natural and Mathematical of the faculty
Recommended to be for approved
by the Academic Council of the University
Record No 4/1, april 4, 2023 y.
Chairman of the Commission Zheldybayeva B.S.

Approved at the meeting of the Academic Council of the University Protocol No. 8 "25" April 2023.

Approved
at the meeting of the Academic Council of the University
Protocol № 1 "01" of September 2023
Chairman of the Academic Council of the University Orynbekov D.R.

Introduction to the profession of a mathematics teacher

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

The course is designed to familiarize with pedagogical activity, its aspects. The study of the regulatory framework of pedagogical orientation. Features of teaching mathematics in various schools, taking into account the profile.. The emergence of the profession of a teacher-mathematician, its development. The role and place of a teacher in modern society. The professional and personal qualities and abilities of the teacher are considered. The requirements for the level of professional competence and knowledge are formulated.

Purpose of studying of the discipline

The objectives of the discipline are the systematization of knowledge and the study of additional sections of elementary mathematics, the development of logical thinking, algorithmic culture necessary for the development of mathematical disciplines of the basic part of the general professional cycle, the consolidation of practical skills related to algebraic transformations, solving problems of some sections of mathematical analysis.

Learning Outcomes

ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Learning outcomes by discipline

- to understand the connections of scientific mathematical knowledge with the content of the school mathematics course to analyze the logical structure of mathematical statements and definitions;
- use logical language to record mathematical statements of different types;
- to establish the truth of logical formulas and mathematical judgments based on the laws of logic and methods of mathematical proofs;
- to carry out proofs by direct and indirect methods, by the method of mathematical induction;
- to operate with set-theoretic concepts and apply them in solving problems.

Prerequisites

School course

Postrequisites

Pedagogical practice (psychological and pedagogical)

Age psychology and physiology

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The course allows you to form an idea of human anatomy and physiology, the specifics and features of age-related development, the patterns of higher nervous activity and functional features of the human nervous system are considered. Forms students` systematic understanding of mental and physiological development in ontogenesis, the main patterns of development and neoplasms of age, the most important mental features of the emerging personality of the child on the basis of taking into account psychophysiological norms.

Purpose of studying of the discipline

Formation of students` ideas about the diversity of approaches to the development of correct, scientific knowledge, mental and physiological development of a person in ontogenesis on the most important issues of psychology and physiological development in the aspect of cultural development. To equip students with theoretical and practical knowledge that contributes to strengthening their professional psychological, pedagogical and physiological training, in-depth study of the section of psychological and physiological knowledge.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria-based assessment, taking into account the individual, physiological and psychological characteristics of students.

Learning outcomes by discipline

1. the formation of an understanding of the mental and physiological development of a person about different views on the most important issues of physiological development with psychology in the aspect of cultural development.
2. strengthens the professional psychological, pedagogical and physiological training of students.
3. equipping with theoretical and practical knowledge, contributing to the improvement of psychophysiological knowledge.

Prerequisites

School course

Postrequisites

Pedagogical practice (psychological and pedagogical)

Bases of economics, law and ecological knowledge

Discipline cycle	General educational disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline

The integrated discipline includes the main issues and principles in the field of fundamentals of law and anti-corruption culture, economics, entrepreneurship and leadership, ecology and life safety. Features of the use of regulatory legal acts, the ability to use the business, ethical, social, economic, entrepreneurial and environmental standards of society. Specifics of environmental-legal, economic, entrepreneurial relations, leadership qualities and principles of combating corruption.

Purpose of studying of the discipline
It consists in studying the basic patterns of the functioning of living organisms, the biosphere as a whole and the mechanisms of their sustainable development under the conditions of anthropogenic impact and emergency situations; in understanding the concept of corruption, the legitimacy of the fight against it, the content of the state penal policy; in the formation of students` basic fundamental stable knowledge on the basics of economic theory, in instilling the skills and abilities of economic thinking; in introducing students to the theory and practice of entrepreneurship, to the basics of creating their own business; in the formation of theoretical knowledge and practical skills for the development and improvement of leadership qualities.

Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.

Learning outcomes by discipline
- analyzes the issues of safety and conservation of the natural environment as the most important priorities of life;
- demonstrates knowledge of the fundamentals of nature management and sustainable development, assesses the impact of man-made systems on the environment;
- shows knowledge of the main regulatory legal acts of the Republic of Kazakhstan, their understanding and application;
- shows knowledge of the patterns of development of economic processes, clearly formulates his own position, finds and clearly sets out arguments in its defense;
- is able to characterize the types of entrepreneurial activity and the entrepreneurial environment, draw up a business plan, create an entrepreneurial structure and organize its activities;
- knows the fundamental provisions about the role of leadership in managing large and small social groups.

Prerequisites
School course

Postrequisites
Basic and profile disciplines of the EP

Mathematical analysis 1

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
A branch of mathematics in which the discipline teaches the method of studying the processes of change, movement, and dependencies between quantities in terms of their quantitative relations. When studying the discipline, the general theory of functional dependencies is considered, the real set of numbers, the sequence of numbers, the limit of the sequence, the concept of a function, the limit of a function at a point, the derivative of a function, methods of plotting a function using a derivative are studied. The student acquires fundamental knowledge of the theory of differential calculations.

Purpose of studying of the discipline
To introduce fundamental research methods by analyzing the finite quantities that make up the differential calculations of a function of one variable.

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Learning outcomes by discipline
- to master the limit and continuity of the function, the connection between them;
- be able to apply the differential calculus of a function in practical tasks;
- be able to calculate the differentials of elementary and complex functions.

Prerequisites
School course

Postrequisites
Mathematical analysis 2

Pedagogy

Discipline cycle	Basic disciplines
Course	1
Credits count	5
Knowledge control form	Examination

Short description of discipline
The content of the discipline is aimed at forming students` holistic understanding of the theoretical and methodological foundations of pedagogical science and the essence of professional pedagogical activity. Studying the course allows you to form the necessary knowledge about the content, principles, forms and methods of organizing a holistic pedagogical process in an educational environment. The study of the course forms the necessary competencies for the successful implementation of modern approaches in teaching and learning.

Purpose of studying of the discipline
Pedagogy as an academic discipline aims to form students` knowledge about the object and subject of pedagogy, its functions, categorical apparatus, methodology of science.
The study of the course provides for the formation of the necessary competencies in the design and evaluation of the pedagogical process in the conditions of an educational institution .The content of the discipline topics allows you to acquire knowledge and skills in the selection and successful application of forms, means, methods of teaching and upbringing.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and

psychological characteristics of students.

Learning outcomes by discipline

1. Knows the basic concepts of the theory of the subject
2. Has knowledge in the system of pedagogical training and makes decisions taking into account the holistic pedagogical process
3. Applies the basic skills of the teacher`s profession.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Training practice

Discipline cycle	Basic disciplines
Course	1
Credits count	2
Knowledge control form	Total mark on practice

Short description of discipline

Mastering the basic professional competencies, including the development of general cultural competencies of students on the basis of educational practice, consolidating and deepening the theoretical knowledge gained in the learning process, basic research skills, business correspondence skills, practical skills and work skills in accordance with the educational program. External observation of students, characteristic. Organization of educational work.

Purpose of studying of the discipline

The purpose of the training practice is the development of general cultural competencies of students, the acquisition of primary professional competencies, including the consolidation and deepening of theoretical knowledge gained in the learning process, obtaining the first skills of research, business correspondence skills, the acquisition of practical skills and work skills in accordance with the educational program

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Learning outcomes by discipline

- know the school documentation
- ways of solving creative professional tasks used by various teachers, practically study the experience of school teachers
- to work out in practice the technology of preparing and conducting educational events: class hours, conferences, debates
- involvement of students in practical activities;
- familiarization of students with the current state of the educational sphere, the specifics of this work, as well as a specific school;
- transfer of pedagogical experience;

Prerequisites

Introduction to the profession of a mathematics teacher

Postrequisites

Basic and profile disciplines of the EP

Elementary mathematic

Discipline cycle	Basic disciplines
Course	1
Credits count	3
Knowledge control form	Examination

Short description of discipline

This course is intended for those who want to consolidate and systematize their knowledge of the general course of secondary school mathematics. The course is the basis of most special courses of the profile direction. During the study, you will learn to read mathematical records competently, formulate a brief condition of the problem and build effective algorithms for its further solution, as well as explain the principles of their construction in a qualified and accessible manner.

Purpose of studying of the discipline

Instilling in students the skills of mathematical thinking, mathematical analysis of applied problems and conducting research using basic mathematical methods. Systematization of knowledge, skills and abilities acquired in the school mathematics course.

Learning Outcomes

ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Learning outcomes by discipline

- explains the educational mathematical material (within the framework of the programs of basic general and secondary general education) and solves and explains the solution of problems of elementary mathematics
- conducts contextual analysis of educational mathematical texts
- determines and evaluates the practical consequences of possible solutions to the problem.
- in the process of solving the problem, makes the correct mathematical conclusions.
- freely apply elementary mathematical solutions in the field of advanced study of mathematics.

Prerequisites

School course

Postrequisites

Basic and profile disciplines of the EP

Analitic geometry

Discipline cycle	Basic disciplines

Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The content of the discipline deals with the equations of straight lines on the plane and the theory of curves of the second order. Equations of straight lines and planes in space, second- order surfaces and related concepts, elements of vector algebra and their application in solving various problems are studied. In the process of mastering the discipline, students deepen their knowledge on topics necessary in accordance with the school mathematics program, and problem-solving skills are formed.

Purpose of studying of the discipline
To introduce students to the main sections of analytical geometry, to teach techniques for solving problems by presenting knowledge about a straight line, plane, curves and surfaces of the second order.

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Learning outcomes by discipline
- owns the elements of analytical geometry on the plane and in space;
- he is able to analyze problems on a straight line, plane, curves and surfaces, choose effective solutions, present the results in an understandable form;
- he is able to apply the learned theoretical material in the school mathematics course.

Prerequisites
School course

Postrequisites
Methods of geometric problems solution Problem-based approach in teaching geometry Geometric construction tasks

Inclusive education

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
When studying the discipline, students acquire knowledge about the principles and methodological foundations of inclusive education. Ideas are being formed about modern models of psychological and pedagogical support for children with special needs, the elimination of existing barriers in the legal support of inclusive education and the competence of organization and management in the area of inclusive practice. Get an idea about the models of psychological and pedagogical support for children with disabilities in educational institutions.

Purpose of studying of the discipline
The purpose of this discipline is to familiarize students with the basic provisions of the organization and management of inclusive processes in education; the formation of a dynamic, effective, self-improving specialist, ready for professional activity in an inclusive education, owning innovative technologies for building an educational route for all students, taking into account their individual needs and capabilities, able to provide social psychological and pedagogical support for children and their families.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.

Learning outcomes by discipline
1. Scientific and practical ideas about the integration of children with disabilities are being formed.
2. Acquainted with the methodological and managerial work of educational organizations in the context of inclusive practice.
3. Understands the peculiarities of the education of children with disabilities in the educational process in inclusive educational organizations.

Prerequisites
Age psychology and physiology

Postrequisites
Basic and profile disciplines of the EP

Mathematical analysis 2

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The discipline is designed to teach integral calculus of a function of one variable and differential calculus of a function of several variables. In the process of studying the discipline, students master the concept of a primitive function, an indefinite and definite integral, ways of integrating various functions, the use of a certain integral, deepen the theoretical knowledge gained in the school mathematics course. It covers the study of the basic concepts of several variable functions, continuity, derivatives and differentials.

Purpose of studying of the discipline
It provides the formation of students ` mathematical culture, fundamental training of students in the field of mathematical analysis, mastering the modern apparatus of mathematical analysis for further application to solving problems of applied mathematics.

Learning Outcomes
ON3 Apply fundamental knowledge of modern mathematics in solving practical problems in various fields of human activity. Interpret the results obtained, build hypotheses about the further course of solving the problem.

Learning outcomes by discipline
The ability to operate with rational and irrational numbers. Plot graphs of functions (using elementary methods). To apply in practice the properties of a continuous function on a segment, the theorem on the continuity of the inverse function. Master the basic techniques of integration. Find partial derivatives of the first and higher orders, the derivative of an implicit function, use the differential in approximate calculations, investigate the function of two variables at the extremum. Investigate numerical series for convergence, decompose elementary functions into a Taylor series. The theoretical basis and scope of application of series and multiple integrals.
Skills of applying mathematical analysis in solving text problems at an extreme. Calculations of the areas of figures in Cartesian and polar coordinates, parametrically defined figures, calculations of the arc length and volumes of spatial bodies. Approximate calculations using the decomposition of elementary functions into a Taylor series. Formulate and solve problems that arise in the course of professional training
Prerequisites
Mathematical analysis 1
Postrequisites
Mathematical analysis 3

Technologies of the updated content of education and criteria assessment

Discipline cycle	Basic disciplines
Course	2
Credits count	5
Knowledge control form	Examination

Short description of discipline
The course is designed to familiarize students with the technology of updated educational content and the features of criteria assessment. During the course, the main documents for secondary schools will be studied, ways of applying the basic principles of organization and planning of educational work, which have gained a permanent place in the practice of many teachers around the world, will be considered. Students master the types of criteria assessment and their features.
Purpose of studying of the discipline
To introduce the technology of the updated content of education and the features of criteria assessment, to form students` skills, such as becoming independent, self- motivated, enthusiastic, confident, responsible individuals with developed critical thinking, showing competence in digital technologies.
Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
Learning outcomes by discipline
- knows about the requirements for the updated content of education, the basic values defined by the content of general secondary education, the basic content of general secondary education;
- masters the methodology of activating the process of involving future teachers in teaching students;
- owns a system for assessing students` knowledge.
Prerequisites
Pedagogy
Postrequisites
Basic and profile disciplines of the EP

World of Abai

Discipline cycle	Basic disciplines
Course	2
Credits count	3
Knowledge control form	Examination

Short description of discipline
The discipline is aimed at studying historical facts, the philosophical and artistic foundations of the works of Abay Kunanbaev, Shakarim Kudaiberdiev, which form worldview and aesthetic values, the student`s ability to express his opinion, practical skills and perception of such human qualities as morality, honesty, artistic character. The genius of the writers of Kazakh literature and the role of M. Auezov in the study and popularization of Abai`s heritage, the significance of his works for history, literature and science are determined.
Purpose of studying of the discipline
Formation of the meaning of philosophical and ideological being, understanding of the problems raised in the works of Abai Kunanbayuly, Shakarim Kudaiberdiuly, Mukhtar Auezov and application of the acquired knowledge in the practice of everyday life.
Learning Outcomes
ON 1 Demonstrate socio-cultural, economic, legal, environmental knowledge, communication skills, apply information technology, taking into account modern trends in the development of society.
Learning outcomes by discipline
1) Analyzes the philosophical and artistic foundations of works, historical facts related to the creative heritage of Abai Kunanbayev, Shakarim Kudaiberdiyev, Mukhtar Auezov
2) Uses in practice the humanistic ideas of Abai`s philosophical and artistic works
3) Assesses the place and significance of Abai`s works in the history of literature and science
Prerequisites
Kazakh language The module of socio-political knowledge (sociology, political science, cultural studies, psychology)
Postrequisites
Basic and profile disciplines of the EP

Pedagogical practice

Discipline cycle	Basic disciplines

Course	2
Credits count	3
Knowledge control form	Total mark on practice

Short description of discipline
Pedagogical practice is aimed at establishing links between theoretical knowledge gained in the study of social, psychological, pedagogical and special disciplines and practice; the formation of students` practical skills and skills in planning, organizing and conducting extracurricular, educational work on the subject; the formation of students` ability to draw up appropriate documentation for work in an educational institution in accordance with the requirements of the updated content secondary education.

Purpose of studying of the discipline
Consolidation and deepening of knowledge in general scientific, cultural, psychological and pedagogical, methodological and special disciplines, as well as the formation of pedagogical skills, skills and competencies based on theoretical knowledge.

Learning Outcomes
ON4 Analyze and solve problems of the theoretical and methodological course of higher mathematics, demonstrate basic knowledge in the field of pedagogy when conducting classes in a modern school using various techniques and techniques.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Learning outcomes by discipline
- knows the ways of interaction of the teacher with various subjects of the pedagogical process;
- designs, organizes and carries out educational work in the classroom, evaluates its results, carries out its reflection;
- provides pedagogical support for the processes of socialization and professional self-determination of students.

Prerequisites
Pedagogy

Postrequisites
Pedagogical practice

Methods of mathematic teaching

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
Пәннің мазмұнында мектеп математика курсының бағдарламасына сәйкес тақырыптарды оқыту әдістемесі қарастырылады. Білім алушыларға мектеп математика оқулықтары мен қосымша дидактикалық материалдарға талдау жасау, оқулықтағы теорияның баяндалу мазмұнымен танысып, берілген күрделі деңгейдегі жаттығулар жүйесін орындау ұсынылады. Пәнді оқып-үйрену барысында білім алушылардың сабақ жүргізу мен сыныптан тыс іс-шараларда оқу үрдісін жүзеге асыру үшін қажетті білім, білік, дағдылары қалыптасады.

Purpose of studying of the discipline
To acquaint students with the methodology of teaching mathematics in secondary schools, the peculiarities of the organization of training and to form students` professional competencies necessary in future professional and pedagogical activities.

Learning Outcomes
ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON5 To design models for the construction of mathematical education, principles, methods and technologies of teaching mathematics. To carry out intrasubject and intersubject connections in the educational process, argues logical reasoning, make your own and find new opportunities, explain mathematical knowledge in various forms.

Learning outcomes by discipline
- possess a system of theoretical and practical knowledge necessary to master the competence;
- use modern teaching methods and technologies;
-formulate and solve problems arising in the course of professional activity that require in-depth professional knowledge

Prerequisites
Mathematic teacing theory

Postrequisites
Pedagogical practice

Theory of possibility and mathematical statistics

Discipline cycle	Profiling discipline
Course	3
Credits count	5
Knowledge control form	Examination

Short description of discipline
This subject introduces the student to the laws of random events., mass random phenomena. To build a probabilistic model of random phenomena, the basic probability theorems (addition and multiplication theorems, total probability, repetition of tests, etc.), the laws of large numbers are used. Having the school basics of mathematical statistics, the student expands his knowledge of the methods of correlation-regression and variance analysis. When testing hypotheses put forward, learn to apply various criteria of Pearson, Student.

Purpose of studying of the discipline
To teach students the fundamental methods of studying probability theory and mathematical statistics and apply this theory to practical calculations.
The basic formulas of the application of probability theory and mathematical statistics in physics, mechanics; axiomatic approach to the definition of probabilities, the main theorems, the Bernoulli scheme, including the local and integral Laplace theorems, the concept of

random variables, their numerical characteristics, the simplest random processes - Poisson.
Basic concepts of set theory, an axiomatic method of presenting probability theory. The main methods of proof and algorithms of probability theory, revealing connections. Modern mathematical modeling methods, the central limit theorem, its consequences and applications in probability theory and in related disciplines such as queuing theory.
To teach how to apply the basic methods of probability theory in solving problems in related fields of mathematics and theoretical physics. Be able to apply doc methods

Learning Outcomes

ON6 Conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning, apply mathematical terms, comprehensively solving typical problems. To design the solution of mathematical problems, to create algorithms of educational work, to formulate proofs competently.
ON7 Master the methodology of solving competitive problems, identify hidden assumptions, formulate and analyze emerging problems using statistical or applied mathematical methods.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Learning outcomes by discipline

- master the methods of proof against the contrary, the method of logical following, the method of syllogism, the method of excluded third, the basics of stochastic thinking.
- to have scientific ideas about randomness, to find cause-and-effect relationships without confusing cause with effect.
- possess methods of mathematical information processing, theoretical and experimental research. Possess the skills of applying the basic algorithms of probability theory and mathematical statistics in all sections of mathematical knowledge.
- applies the apparatus of mathematical statistics to hypothesis testing;
- conduct experiments in the field of classical branches of mathematics, describe methods of mathematical reasoning.

Prerequisites

School course

Postrequisites

Methods of solving probabilistic problems

Pedagogical practice

Discipline cycle	Basic disciplines
Course	3
Credits count	5
Knowledge control form	Total mark on practice

Short description of discipline

Pedagogical practice is aimed at the formation of professional pedagogical competencies related to the design and implementation of the educational process of learning in the education system. Students master the norms and values of the teaching profession, professional orientation is carried out in obtaining experience of pedagogical activity. At the stage of theoretical training at the university, creative, research views are formed using various methods of teaching mathematics

Purpose of studying of the discipline

- consolidation of theoretical knowledge gained in the process of studying the main academic disciplines
- mastering practical skills and abilities necessary for the professional development of a specialist in mathematics
- disclosure of the links between the fundamental sciences and the tasks of practical content
- implementation of intersubject and intrasubject relations.

Learning Outcomes

ON2 Apply modern teaching technologies and criteria- based assessment, taking into account the individual, physiological and psychological characteristics of students.
ON8 Demonstrate the desire for professional self-improvement, work in a team, make decisions, show leadership qualities. Evaluate the work of colleagues, make judgments on the topic under consideration, draw conclusions from the materials studied.

Learning outcomes by discipline

- planning and conducting lessons and extracurricular activities
- to organize the basic requirements for the organization of classes
- organize pedagogical communication with students
- demonstrating the skills of working with the main applications related to the teacher`s work.

Prerequisites

Basic and profile disciplines of the EP

Postrequisites

Production (pedagogical) practice