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**METHODOLOGICAL RECOMMENDATIONS FOR
PRACTICAL CLASSES**

by discipline

Lectures on advanced developments in electronic information engineering

Training area

02.04.01 Mathematics and Computer Science

Orientation (profile)

Training Program for Electronic Information

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Practical 1. Scientific work in the specialty

1. Scientific study as the main form of scientific work;
2. Basic concepts of research work.

1. Scientific study as the main form of scientific work

From the creative idea to the final design of the scientific work, the scientific- individual research is carried out individually.

Modern scientific and theoretical thinking seeks to penetrate into the essence of the complexity of the studied phenomena and processes. This is possible under the condition of a holistic approach. access to the object of study, consideration of this object in its origin and development, that is, applying a historical approach to its study.

New scientific results and previously accumulated knowledge are in the dialectic of physical interaction. The best and progressive from the old goes to the new and yes- it gives it strength and effectiveness.

To study in a scientific sense means to conduct exploratory research, as if in a scientific sense. looking to the future, apply scientific foresight and a well-thought-out approach. chet, be scientifically objective. You can't put the facts aside just because that they are difficult to explain or put into practice.

Scientific study obliges not only conscientiously to portray or describe hundred describe the phenomenon under study, but also find out its relation to what is known or unknown. from experience, or from previous study. To study is to measure what can be done. to be measured, to show the numerical ratio of the phenomenon under study to the value of search for the cause of the relationship between the phenomena under consideration- facts and events. By focusing on the main or key issues In these questions, it is necessary to take into account the so-called indirect facts, which are at the first stage of the analysis. at first glance, they seem insignificant.

It is not enough to establish any new scientific fact in the course of research, it is important to give it an explanation from the standpoint of science, to show the theoretical or practical the actual value. Accumulation of scientific facts in the research process. a process that is always based on the researcher's idea or name.

Ideas are born out of practice, observation of the world around us, and the need to learn more. the steyp of life. The development of the idea to the stage of solving the problem is carried out as planned

the process of scientific research.

2. Basic concepts of research work

The language of science is very specific. It contains many concepts and terms that have a common meaning. participation in scientific activities. The language is based on the words and phrases ter- of a minological nature:

Abstract of the dissertation - a scientific publication in the form of a booklet containing the following information: abstract of the research conducted by the author.

Analogy - a reasoning in which, from the similarity of two objects in some cases, signs are inferred to be similar in other ways as well.

Relevance of the topic - the degree of its importance at the moment and in this situation to solve this problem.

Aspect - the angle of view from which the object of research is viewed.

Hypothesis - a scientific assumption issued by what is expected to explain any phenomena? research institute.

Deduction is a type of inference from the general to the particular, when from the mass of particular cases, a generalized conclusion is drawn about the totality of such cases.

A dissertation is a scientific work made in the form of a manuscript, a scientific report, etc. a report, published monograph, or textbook. Serves as a qualifier- an innovative work designed to show the research level of the research process. submitted for the academic degree.

An idea is a defining position in the system of views, theories, etc.

Induction is a type of inference from particular facts, propositions to general conclusions. **Information:**

- review - secondary information contained in reviews of scientific documents;

- relevant - information contained in the description of the prototype of a scientific problem;

- abstract - secondary information contained in primary scientific reports. documents;

- signal-secondary information of various degrees of coagulation, performed by using the pre-notification function;

- reference - secondary information, which is systematized brief information in any field of knowledge.

Review - a scientific document containing systematized scientific data on information about any topic obtained as a result of the analysis of primary sources.

Object of research - a process or phenomenon that generates a problem situation and favorites to explore.

Definition is one of the ways to prevent misunderstandings in communication, dispute resolution and research.

Subject of research - everything that is located within the boundaries of the object of research in the Russian Federation. a certain aspect of the review.

A concept is a thought that reflects the distinctive properties of objects and objects. the relationship between them.

Principle - the basic, starting point of any theory, exercises and sciences.

Problem - a large generalized set of formulated scientific questions, which cover the area of future research. There are the following types: problems:

- research-a set of related research topics within the boundaries of a single topic. scientific discipline and in one field of application;

- complex scientific-interrelation of scientific research topics from various fields. areas of science aimed at solving the most important national economic problems;
- scientific - a set of topics covering the entire research work. one or part of it;

A judgment is a thought that asserts or denies something.

Theory - a teaching, system of ideas or principles. A set of generalized positions research institutes that form a science or its branch.

Inference is a mental operation by means of which, from a certain number of points, a person can draw a conclusion. from the number of given judgments, a different judgment is derived, which is related in a certain way. combined with the original one.

Factographic document - a scientific document containing a textual, digital, or digital signature. basic, illustrative, and other information that reflects the condition of the item research or collected as a result of research work. Claim of an invention - a description of an invention drawn up in accordance with the approved procedure.

form and containing a summary of its essence.

Opening formula - a description of the opening made in accordance with the approved form and containing an exhaustive statement of its essence.

Practical 2. GENERAL METHODOLOGY OF SCIENTIFIC CREATIVITY

1. General scheme of scientific research progress;
2. Using the methods of scientific cognition.

1. General scheme of scientific research progress

The entire course of scientific research can be presented in the form of the following logic: technical scheme:

Justification of the relevance of the projectnew topic;

- Setting goals and specific research objectives;
- Definition of the object and subject of research;
- Selection of the research method (s) ;
- Description of the research process;
- Discussion of the research results;

* Drawing conclusions and evaluating the results obtained.

Justification of the relevance of the chosen topic is the initial stage of any research. vania. Coverage of relevance should not be verbose. Start by describing it. there is no special need to travel from afar. It is sufficient within one typescript. the main page shows the essence of the problem situation, from which the information will be visible. the theme is versatile.

Scientific research is conducted to overcome certain difficulties, which manifest themselves in so-called problem situations, when there is a significant risk of As a result, the existing scientific knowledge is not sufficient to solve new problems of research. knowledge.

A problem in science is a contradictory situation that requires its own solution. research institute.

From proving the relevance of the chosen topic, it is logical to proceed to the formula: the purpose of the research being undertaken, as well as indicate specific tasks, issues to be addressed in accordance with this goal.

Next, the object (process or phenomenon that generates a problem) is formulated. current situation and favorites to study) and subject (something that is within the boundaries of object) of the study.

A very important stage of scientific research is the choice of research methods. research tools that serve as a tool in obtaining factual material, being a necessary condition for achieving the goal set in such work.

Description of the research process - the main part of the dissertation work, in which which covers the methodology and technique of research using logical methods. laws and regulations.

A very important stage of scientific research is the discussion of its results, pre-comparative assessment of the theoretical and practical value of scientific work.

The final stage of scientific research is the conclusions that will be drawn from the results of the research. something new and essential that makes up scientific and practical results works.

2. Use of scientific knowledge methods

There are general and special methods of scientific knowledge. To the methodological section the scientific activity is based on the criteria of objectivity, compliance with the historical not, in historical truth, moral criteria.

Methodological sources of research can be the works of leading researchers. russian and foreign scientists.

Most special problems of specific sciences and even individual stages their research requires the use of special solution methods. Special offers the solution methods are very specific and are determined by the nature of the object under study.

General methods of scientific cognition are used throughout the research. the teaching process. They are divided into three groups:

1-methods of empirical research (observation, comparison, measurement, experiment). riment);

2 - methods used both at the empirical and theoretical levels of research. follow-up (abstraction, analysis and synthesis, induction and deduction, modeling etc.);

3-methods of theoretical research (ascent from the abstract to the concrete, specific, etc.).

Observation is an active cognitive process based on the following principles: It affects the work of the human sense organs and their objective material activity. This is a new feature. This is the most elementary method, which usually serves as an alternative to one of the elements in other empirical methods. Monitoring should include they will satisfy you a number of requirements, the most important of which are:

- 1) consistency;
- 2) purposefulness;
- 3) activity;
- 4) systematic approach.

Comparison is one of the most common methods of cognition. It will allow you to It helps to establish the similarity and difference of objects and phenomena of reality.

For a comparison to be fruitful, it must satisfy two conditions: basic requirements:

- only such phenomena should be compared, between which there may be a significant difference between them. there is a certain objective commonality;
- in order to recognize objects, their comparison should be carried out according to the most common criteria. An important, essential (in terms of a specific cognitive task) application is signs.

Using a comparison, information about an object can be obtained in two ways: by personal means:

- as a direct comparison result;
- as an inference by analogy.

Measurement in contrast to comparison is more accurate cognitive a tool. Measurement is a procedure for determining the numerical value of a certain value. values by unit of measurement.

The most important indicator of the quality of measurement and its scientific value is accuracy. Measurement is one of the empirical methods of scientific knowledge. about the same place as observation and comparison. A special case of observation is The research institute is an experiment.

Experimental study of objects in comparison with observation has the following advantages: a number of advantages:

1 - in the course of an experiment, it becomes possible to study one or another of the following: phenomena in their "pure form";

2-the experiment allows you to study the properties of objects of reality in the following cases: extreme conditions;

3-the most important advantage of the experiment is its repeatability.

The use of models makes it possible to apply an experimental research method. do to sothey are objects that are difficult to operate directly with. or even impossible.

Methods used at the empirical and theoretical levels of research include: These include abstraction, analysis and synthesis, induction and deduction.

The process of abstracting is a set of operations that lead to obtaining such a result (abstraction). Abstracting information in mental activity universal character. The essence of this method is a mental distraction from non-essential properties, connections, relationships, objects and in the simultaneous selection of dividing or fixing one or several aspects of interest to the researcher these items.

There is a distinction between the process of abstracting and the result of abstracting, called an abstraction. The process of abstracting is closely related to other research methods. and, above all, with analysis and synthesis. Analysis is a method of scientific research. following by decomposing the object into its component parts. Synth represents it is a combination of the parts obtained in the analysis into something whole.

Methods of analysis and synthesis in scientific creativity are organically connected with each other. they are different and can take different forms depending on the properties of the object being studied. the object and purpose of the study. Direct and empirical analysis and synthesis is applied at the stage of cursory familiarization with the object.

Recurrent or elementary-theoretical analysis and synthesis is widely used. It is used as a tool for achieving the essence points of the phenomenon under study.

The most profound insight into the essence of an object is provided by the structural-genetic analysis and synthesis. This type of analysis and synthesis requires isolation in

the complex phenomenon of such elements, such links, which represent the most central, the most important thing in them, their "cell" that has a decisive influence to all other sides of the object's entity.

For the study of complex developing objects, a historical approach is used. the Russian method. It is only used where one way or another the subject of research becomes the object's history.

Let us consider the method of ascending from the abstract to the concrete. Vozdozhde- moving from the abstract to the concrete (method of theoretical research) It is a universal form of the movement of scientific knowledge, the law of mapping of actual knowledge. in thinking, which divides the process of cognition into two relatively simple stages. two independent stages.

At the first stage, there is a transition from the sensually concrete, from the concrete- go in reality to its abstract definitions. A single item divides- It is described using a variety of concepts and judgments.

The second stage of the process of cognition is the ascent from the abstract to the concrete. Its essence consists in the movement of thought away from abstract definitions of an object.

Practical 3. GENERAL METHODOLOGY OF SCIENTIFIC CREATIVITY

1. Application of logical laws and regulations;
2. Inference judgments (inductive and deductive);
3. Rules for constructing logical definitions.

1. Application of logical laws and regulations

The law of identity. According to the law of identity, the object of thought within the same It should remain unchanged, that is, it should not be used in any other way. A is. A A = A where A is thought. The law requires that in the course of communication, all concepts and judgments must have the same meaning. a no-value character that excludes ambiguity and ambiguity. External- non-identical verbal constructions may have different contents, and, on the other hand, they may have different meanings. Of course, the same thought can be expressed in many different ways. The first phenomenon is called **the first is called homonymy, and the second is synonymy.**

Zakothe concept of contradiction expresses the requirement of consistent thinking.

Two statements cannot be true at the same time, one of which is that one asserts and the other denies the same thing.

The law of the excluded third-from two contradictory propositions one is false and the other is true. The third is not given.

The importance of the law of the excluded third for conducting scientific work consists in the fact that it requires consistency in the presentation of the facts and does not provide sufficient evidence. Lets in contradictions.

The Law of Sufficient Reason expresses the requirement of evidence-based scientific research. conclusions, reasonableness of judgments, which is formulated as follows: all at once: every true thought has a sufficient foundation.

Any judgment that we use in scientific work before being accepted as true, it must be justified. This law helps to separate is-distinguish the true from the false and come to the right conclusion.

2. Inference judgments (inductive and deductive)

Deductive inference is an inference in which the conclusion about a certain element of the The concept of a set is made on the basis of knowledge of the general properties of the entire set.

Induction is usually understood as inference from the particular to the general when based on knowledge about a part of the class's subjects, a conclusion is drawn about the class as a whole.

Induction (or generalization) can be complete or partial. The full version consists in the study of for each case that is included in the class of phenomena for which conclusions are drawn conclusions.

Most of the indicators presented in scientific texts are the result of a change in the individual examples, ways to justify their use in texts the following:

1-determine whether the example used as the basis for generalization is correct;

2-find out if the example is relevant to the conclusion;

3-determine whether the following information is sufficient formerov;

4-determine whether the selected examples are typical.

In scientific research, the object is often single non-repetitive data. events, objects, and phenomena that are unique in their individual characteristics. When explaining and evaluating them, it is difficult to apply both deductive and in-depth methods.-

constructive reasoning. In this case, they resort to inference based on the analysis of logic, when they compare a new single phenomenon to another, known and similar one. a single phenomenon associated with it, and extend the previously obtained information to the first one. information.

Not all analogies are logical, so it is necessary to check them. To the entity- there are two ways to check them:

1 - is it really appropriate to compare phenomena?

2-is there a significant difference between the two?

The causal relationship judgment is another variant of induction, which plays a special role in determining the causal relationship. It plays an important role in the scientific text.

In each controversial case, inferences about causal dependence are applied- the following verification rules apply:

1. Does the alleged consequence arise when there is no alleged consequence? the reason? If the answer is "yes", then you are not entitled to claim that the preceding phenomenon is not true. this is the only possible reason. Or is there no connection between the two phenomena? or there is another possible reason;

2. Is the alleged effect absent when the alleged cause is obvious? If the answer is "yes", then you can not claim that the subsequent phenomenon there is only one possible consequence. Or is there no connection between the two phenomena? or there is another possible consequence;

3. Isn't the only connection between an investigation and its presupposition a significant one? the intended cause is only the random occurrence of one after the other? This the method allows you to identify a characteristic error in the conclusion about the cause, the well-known title is "after this, therefore, for the reason of this". This error is a form of careless generalization of fragmentary information. research institute;

4. Are there any other possible reasons? The reason that concerns us or the nearest one these phenomena usually seem more obvious than the underlying cause. Bias- Failure to identify the root cause is a common form of fraud. 5. Are there any other possible consequences? In most cases, the conclusion is from cause to effect is actually a prediction of future events.-

tiy. In such cases, absolute verification is not possible. Since the conclusion from cause-to-effect has the future in mind, and it is influenced by production processes. free thinking.

Deduction is the shortest path to knowledge. Deduction consists of three propositions:

- 1 - a general provision called the big premise;
- 2 - a related judgment that leads to its application, called small package;
- 3-conclusions.

This whole three-part process is called a syllogism.

Sometimes one of the premises or conclusions is omitted. This abbreviated one a syllogism is called an entima. To restore the enthymeme to its full sill- gism, you should follow the following rules:

- 1-find the conclusion and formulate it in such a way that the larger and smaller the terms were clearly expressed;
- 2 - if one of the premises is omitted, set which of them (large or small) is the most important one. shaya) is available. This is done by checking which of the extreme terms is contained in this judgment;
- 3-knowing which of the premises is omitted, as well as knowing the middle term (it is available in the same premise that is given), define both terms of the missing premise. Deduction- positive inferences are checked in two ways:

- 1 - are the packages correct?
- 2 - does this conclusion follow from them?

Doc skillexpress their opinions and refute (if necessary) the arguments of the op- Ponentov's argumentation is a purely logical process, the essence of which is in that it justifies the truth of our judgment with the help of others - judgments. Argumentation achieves its goal when the rules of proof are observed. properties:

1. The thesis of the proof should be formulated clearly and clearly. You can't do this allow ambiguity.
2. In the course of the proof, the thesis must remain unchanged, i.e., it must be proved that the same position can be called.

The main mistakes in the construction of the thesis:

1. Losing your thesis. Having formulated a thesis, they forget it and move on to something else a thesis that is directly or indirectly related to the first one, but in principle already has a different approach. position. Then they touch on the third fact, and from it they move on to the fourth, and so on. In the end, they lose the original idea, i.e. they forget what they started arguing about.

2. Complete substitution of the thesis. Having advanced a certain position, they begin to prove the use something else that is close or similar in meaning, i.e. they replace the main one the thought is different. A kind of substitution of the thesis is a trick.

Another type of substitution of the thesis is an error, which is called "logical diversion". Feeling unable to prove or refute you- when the speaker is in a moved position, he or she tries to switch attention to the discussion. there is another, possibly very important, statement, but it does not have a direct connection. links to the original thesis.

3. Partial substitution of the thesis. When, in the course of the proof, an attempt is made to modify the thread your own thesis, narrowing or softening your original too general one, an exaggerated or unnecessarily harsh statement.

The following requirements apply to arguments::

1-only the following provisions can be used as arguments, the truth of the co- which have been proven or they do not raise any doubts at all;

2-arguments must be proved independently of the thesis;

3-arguments must be consistent;

4-arguments must be sufficient.

The requirement for arguments to be true is determined by the fact that they fulfill the role of the foundation on which the entire proof is built. Violation of this requirement results in two errors:

- a "false argument", i.e., the use of a non-essential element as an argument. in case of a missing fact, a reference to an event that didn't happen, etc.

- "ground anticipation" - when the truth of an argument does not establish- not with certainty, but only assumed. In this case, as an argument- unproven or arbitrarily taken propositions are used.

Argument autonomy requirement - arguments must be proven not to be independent.-

depends on the thesis.

Argument consistency requirement - arguments must not contradict each other. talk to each other.

Argument sufficiency requirement - arguments in their entirety they must be such that they necessarily imply a provable test.
vms. Here, there are two types of errors:

1 - insufficient arguments;

2 - excessive proof.

Very often mistakes are made due to the lack of a logical connection between the arguments and the thesis.

One of the forms of this discrepancy is an unjustified logical transition from from a narrow area to a wider area.

Another form of discrepancy is the transition from what is said with a condition to what is said with a condition. noma, of course.

In a scientific work, it is very often necessary to make a refutation of the given statement. dov. Depending on the purpose of the critical examination, it may be determined by the following criteria: It is completed in the following ways: criticism of the thesis, criticism of arguments, and criticism of coy demonstrations.

The first method is to criticize (refute) the thesis. Its goal is to show a mismatch between the validity (false or erroneous) of the thesis submitted by the proponent. Refutation of such a thesis may be direct or indirect.

A direct refutation is constructed in the form of an argument called "reduction to absurdity". The reasoning in this case is as follows: first, conditionally assume the truth of the proponent's position and a consequence that follows logically from it is deduced. If when mapping If it turns out that they contradict objective data, then the fact that the results of the investigation are connected with the facts is not clear. thus, they are recognized as untenable. On this basis, a conclusion is drawn about the non- We also stand by the thesis itself, reasoning according to the principle: false consequences are always true. evidence of the falsity of their foundation.

In the process of argumentation, a direct refutation performs a destructive function. a function. It is used to show the inconsistency of the proponent's thesis, which is not considered to be valid.

putting forward no idea in return.

Indirect refutation is constructed in a different way. The opponent may not directly analyze the thesis of the opposite side, without checking either the arguments or de-monsters of the proponent. It focuses on a thorough and comprehensive analysis of the We need to substantiate our own thesis.

If the argumentation is sound, then the second step is taken - the approach to the future. This leads to the conclusion that the proponent's thesis is false. Such a rebuttal is applicable only if the thesis and antithesis are governed by the principle of "third-party non-discrimination". given", i.e. only one of the two statements being proved can be true.

The second method of destroying previously held evidence is "criticism arguments". You should only use arguments, truth value of which there is no doubt.

If the opponent manages to show the falsity or doubtfulness of the arguments, then The proponent's position is significantly weakened, because such criticism shows that the proponent's position is not correct. validity of his thesis. Criticism of an argument can be expressed in pointing out that inaccurate presentation of facts, ambiguity of the procedure for generalizing statistical data. expresses doubts about the credibility of the expert whose conclusion is based on the use of statistical data. rogo refers the proponent.

Reasonable doubts about the correctness of the arguments (arguments) with the necessary- They are transferred to the thesis that follows from such arguments (arguments), and then they are transferred to the thesis that follows from such arguments (arguments). therefore, it is also regarded as doubtful and needs a new independent state. a valid confirmation.

The third method of refutation is to criticize the demonstration. In this case, so far- it is shown that the proponent's reasoning does not have a logical connection between the arguments and the thesis. When a thesis does not follow from an argument, it "hangs" in the air and it is considered unfounded.

3. Rules for constructing logical definitions

The proportionality rule requires that the scope of the concept to be defined should be equal to according to the scope of the defining concept. In other words, these concepts should find- with respect to identity. For example: "The fish industry technologist is an engineer who specializes in the treatment of hydrobionts." If the same " techno-

log" is defined as a person specializing in fish processing, then the rule is proportionality will be violated: the scope of the defining concept (person, specialist). based on the processing of fish) is already the scope of the defined concept (technologist). Ta- some violations of the proportionality rule are called too narrow behavior errors. *Denia*.

The error will also occur if we define the technologist as specialista in the field of technology in general. In this case, the defining concept is it will be much broader than what is defined, since technologists are not only co in the fishing industry. Such an error is called an error of too broad definition. *lenia*.

If, when defining a concept, we resort to another concept, which, in particular, in turn, it is determined using the first one, then such a definition contains in imagine a circle whose type in the definition is a tautology. Tauto- logic - an erroneous definition, in which the defining concept repeats the definition of a given term. divisible.

Sometimes, when defining concepts, several specific features are indicated (co-ordinates). where it is not possible to specify a single feature that would distinguish the given value. the concept differs from all others and would reveal its content in a significant way). A truly scientific definition of complex phenomena and facts cannot be limited. formal and logical requirements. It should contain the op - non-determinable facts, excluding the one-sided approach inherent in the recent past. the past of all Russian science. In this case, you should also take into account the special specifics of scientific texts.

Practical 4. PREPARATION FOR WRITING A SCIENTIFIC PAPER AND ACCUMULATION OF SCIENTIFIC INFORMATION

1. Choosing a theme;

2. Drawing up work plans;

3. Bibliographic search of literary sources;

4. Study of literature and selection of factual material.

1. Choosing a theme

Research topics can be determined by organizations or by the researcher himself. The following techniques help you choose a research topic::

1. View protected research directories and get acquainted with already completed projects. scientific works;
2. Familiarization with the latest research results in related, borderline research areas. areas of science and technology;
3. State assessmentdevelopment of research methods and technological techniques in relation to the planned work;
4. Review of well-known scientific solutions using new methods, from new approaches to the development of scientific knowledge. theoretical positions, with the involvement of new material facts identified by the author. a researcher.

When selecting a topic, the researcher should formulate a goal, specific tasks, and goals. aspect of its development. The work is carried out under the supervision of leading scientists working in the field of working in the organization where the work is performed. The scientific supervisor directs: the researcher's work, helping them evaluate possible solutions.

Question 2. Drawing up work plans

Scientific work presupposes the existence of a plan for its implementation. Work plan, it provides a visual diagram of the research being undertaken and begins with the following sections: the work of the topic, i.e. the idea of the intended scientific research.

The work plan has an arbitrary form and consists of a list located in a column of categories related to the internal logic of research on this topic and allows you to They can be used to judge their relevance and significance by their place.

At later stages of work, a plan-prospectus is drawn up.

The desirability of drawing up a plan-prospectus is determined by the fact that, by means of a systematic approach, It is possible to achieve the goal of automatically including more and more new data in such a plan. until the final structural and factual scheme of the scientific work.

After drawing up a research plan, the researcher needs to understand: the order and logical sequence of scheduled work. Not studied yet

the first section, you can't go to the second one.

In creative research, the plan always has a dynamic, moving character. It can not, should not, link the development of the idea and the researcher's idea in the course of research. It keeps some kind of clear and defined the main scientific direction in the work.

The plan should be flexible so that new opportunities can be included in it. Key aspects discovered during the text preparation process.

Question 3. Bibliographic search of literary sources

Introduction to the literature published on the topic of scientific work begins with the development of an idea, i.e. the design of the proposed scientific research, which, as mentioned earlier, it finds its expression in the topic and work plan of the scientific research project. New work.

Next, you should think through the search procedure and start drawing up a file cabinet (or a list of) literature sources on the topic. A well-organized file system (list) even with a cursory review of source titles, it allows you to cover the topic in a comprehensive way. Overall. Based on this information, you can specify your goals at the beginning of the study.

All types of sources should be viewed, the content of which should be included in the list. It is related to the topic of scientific research.

The best way to start this work is to get acquainted with the information resources of the company. **publications.**

Publications are divided into three types: bibliographic, abstract and review- new ones.

Bibliographic publications contain an ordered set of bibliographic sources. graphic descriptions that inform specialists about what has been published on the Internet. the question that interests him. Bibliographic descriptions are used to make up a bibliographic list. geographical indexes and bibliographic lists.

Abstract publications contain publications of abstracts that include abbreviations. simplified presentation of the content of primary documents (or parts thereof) with the main features of their content. factual information and conclusions.

Abstract collections are periodic, non-publication projects. happy documents. They are issued by the central institutes of scientific and technical research. technical information and feasibility studies. Such publications

they are usually narrowly thematic in nature.

Express - informatsiya (EI) is a periodical publication of a magazine or journalistic publication. a product form that contains extended abstracts of the most relevant topics. published foreign materials and unpublished domestic reports. documents that require prompt coverage.

Information sheets - operational printed publications that contain: research papers that reflect information on best production practices or best practices. scientific and technical achievements.

Review publications include an overview of a single issue, topic, and topic. collection of reviews.

Automated information systems are used for information retrieval. but-search engines, databases, and data banks.

Thematic indexes and reviews are the main part of retrospective publications on natural science and technology, reflecting the literature on any industry in general. scrap metal or by its section. They are issued by scientific and technical libraries in the Russian Federation. scientific and research institutes and higher educational institutions, as well as the service- mi of scientific and technical information.

A special type of retrospective bibliography is intra - book and post-article bibliographies **references**.

Question 4. Study of literature and selection of factual material

The study of literature on the chosen topic begins with general works in order to get the most out of it. get an idea of the main issues that the selected topic is related to, and then they are already searching for new material.

The study of scientific publications is preferably carried out in stages:

- general introduction to the work as a whole by its table of contents;
- quick view of all content;
- reading in the order of the material's placement sequence;
- selective reading of any part of the work;
- extract materials of interest;
- critical evaluation of the recorded content, its editing and "finishing" recording as fragment of the text of a future research paper.

When studying the literature, you do not need to think about the information found, which means that it can serve as a basis for obtaining new knowledge.

When studying the literature on the selected topic, not all the information in the article is used. It is a prisoner, but only the one that is directly related to the topic of scientific work. Thus, the criterion for evaluating what has been read is the possibility of the possibility of its practical use in scientific work.

When studying literary sources, you need to monitor the design of extracts, so that it would be easy to use them in the future. Careful selection is required and evaluation of the obtained data, selection of the main and additional information, and its use. generalization and presentation in a form that is convenient for analysis and conclusions

It is necessary to collect only scientific facts - the elements that form the basis of scientific research. scientific knowledge that reflects the objective properties of things and processes that they are characterized by such properties as novelty, accuracy, objectivity, and accessibility. accuracy.

The great cognitive significance of new scientific facts requires taking into account the critical aspects of scientific research. critical assessment of their effectiveness. The accuracy of a scientific fact is determined by the object- It also characterizes the totality of the most significant advantages of signs of objects, phenomena, events, their quantitative and qualitative definitions. research institute.

The reliability of a scientific fact characterizes its real, unconditional existence. a name that is confirmed when constructing similar situations.

The reliability of scientific facts depends to a large extent on the reliability of depending on the primary sources, their intended purpose and the nature of their information. Monograph as a scientific publication containing the results of a comprehensive and comprehensive study of the a scientific collection containing materials on a specific topic or problem. scientific conference; scientific collection, including research materials institutions, educational institutions or societies on the most important scientific and scientific-technical issues. technical problems are among the reliable sources. Practice- descriptions of inventions have almost absolute reliability.

The reliability of scientific articles is considered depending on which ones they belong to. they belong to the sciences (scientific and technical or humanitarian). Theoretical-

each article in the field of technical and other exact sciences is distinguished by its accuracy evidence.

In the field of engineering and technology and other sciences, it is often necessary to deal with articles that substantiate and present the results of completed studies. Such information indicates the originality of the article, its theoretical significance, and its relevance. of theoretical and practical significance.

An informational article is usually up-to-date and up-to-date. a specific statement of any facts, a message about any event, a phenomenon, etc. research institutes.

Like articles, reports with varying degrees of reliability are also available. read at scientific conferences, symposia, etc.

The reliability of the initial information may be indicated by a scientific, practical approach. professional authority of its author, his / her affiliation to a particular scientific field school.

A special form of factual material is citations that are organic in nature. research results are interwoven into the text of a scientific paper, forming an integral part of the analysis. the required material. Citations can also be used to confirm individual cases. provisions cited by the author.

The selected factual material is carefully recorded. Forms of its registration straciand quite diverse:

- a) records of the results of experimental studies, various types of measurements, etc. research projects and observations;
- b) extracts from the analyzed documents, literary sources (articles, books, etc.); abstracts, dissertations, etc.).

Practical 5. WORK ON THE MANUSCRIPT OF A SCIENTIFIC PAPER

1. Preparation of a draft manuscript and presentation of scientific materials;
2. Composition of scientific work;
3. Text categorization;
4. Language and style of scientific work.

1. Preparation of a draft manuscript and presentation of scientific materials

The draft manuscript is made on standard sheets of writing paper, filled in with the following documents: using them only on one side. Each page must be filled in, leaving space for subsequent additions and changes. Constantly need to monitor make sure that you don't deviate from the given topic.

The introduction is written later, when you know exactly what happened. Then you need to it is necessary to think about what is already known about the topic of the work and what else will need to be learned. clarify and determine the most logical sequence of presentation of available data. materials.

Then proceed to the layout of the central part of the work (on a separate page). at the end of the paper or in a text editor). A draft version of the main part is being prepared as early as possible. The longer it takes, we will continue working with the draft version of the text. the more it is possible to improve it. After a rough draft is made up a large share of the main part of the work, write its final part.

When you know exactly what the work is written about and what the conclusions are, write an introduction that should indicate what has already been written, then it is automatic. chesky will match the content. Then they start editing it the text. At the same time, they strive to, so that each paragraph contains its own information the idea in the most clear and understandable form.

There are several methodological techniques for presenting scientific materials:

- 1) strictly consistent;
- 2) holistic (with subsequent processing of each chapter);
- 3) selective (chapters are written separately, in any sequence).

Strictly consistent presentation of the material of scientific work requires: it takes a relatively long time, since the author has not yet completed the entire sequence. The user can't move on to the next section.

A holistic approach requires almost half as much time to prepare the white paper. howling of the manuscript, since first the entire work is written in rough, then it produces- it is processed in parts and details, with additions and corrections being made.

Selective presentation of materials - as soon as the actual data is ready the author processes the materials in any order that is convenient for him.

The researcher chooses the method of presenting the material that he considers appropriate. the most appropriate way to turn a so-called draft manuscript into a pro- interstitial or white (final).

At this stage of work on the manuscript, it is advisable to select individual chapters. the following compositional elements of a scientific paper:: 1) introduction; 2) conclusions and recommendations proposals (conclusion); 3) bibliographic list of references used in the literature. sources; 4) appendices; 5) indexes.

Work on the white manuscript begins when the layout of the draft manuscript is ready. All the necessary materials have been collected, and the necessary generalizations have been made. Thereafter detailed revision of the manuscript text begins.

2. Composition of scientific work

The composition of a scientific paper is a sequence of basic elements- parts that include the main text (i.e. chapters and paragraphs), and also parts of its reference and accompanying apparatus.

There is no standard for choosing the composition of a scientific paper. Each author from- takes any system and order of organization of scientific materials in order to get their external location and internal logical connection in the form that it is considers it the best, most convincing way to reveal your creative intent. Traditionally, the following compositional structure of scientific production has been formed: management, the main elements of which, in order of their arrangement, are: title page, table of contents, introduction, chapters of the main part, conclusion, bibliography. physical list, appendices, and auxiliary pointers.

The title page (Fig.) is the first page of a scientific paper and is filled in by the author. it is performed according to strictly defined rules.

In the upper field, enter the full name of the educational institution or scientific institution. a new organization. The upper field with the specified text is separated from the rest of the field. cover the title page with a solid line. Next, the surname, first name and report are indicated. name of the researcher (in the nominative case).

The middle field contains the title of the research project. The title should be as long as possible keep it short, accurate, and consistent with its main content.

If a dissertation is being prepared, then a cipher from

nomenclature of the specialty and the academic degree for which you are submitted. scientific work is being carried out.

Then, closer to the right edge of the title page, the surname and initials are indicated. the name of the supervisor, as well as his academic title and academic degree.

In the lower field, indicate the place of scientific work and the year of its writing. research institute.

After the title page, a table of contents is placed, which contains all the information provided. subheadings of scientific work (except for subheadings, dawain the selection with the text) and indicate the pages where they start are displayed. The headings of the table of contents must be accurate. but repeat the headings in the text.

The introduction explains the relevance of the chosen topic, its purpose and content tasks are set, the object and subject of the study are formulated, and the following information is indicated: the chosen method (or methods) of research, it is reported what the theoretical and practical aspects of the research are. the theoretical significance and applied value of the results obtained, as well as the results obtained from the provisions that are put up for defense are marked.

Relevance begins with the justification of the significance of the chosen topic. Lighting- the up-to-date message should be short within one or two pages. computer text.

COMMITTEE OF THE RUSSIAN FEDERATION ON FISHERIES
Far Eastern State Technical Fisheries Institute
university (Dalrybvtuz)

Ivanov Ivan Ivanovich

**DEVELOPMENT OF TECHNOLOGY FOR
BURROWING PRESERVES
SHELLFISH**

Specialty 05.18.04-technology of meat, dairy, fish
products and

refrigeration production facilities

Dissertation for an academic degree
candidate of technical sciences

Scientific supervisor:

Sidorov I. I.-Doctor of Technical Sciences

Doctor of Sciences, Professor

Vladivostok 2003

Fig. Title page of the thesis

A brief review of the literature should lead to the conclusion that this particular topic it has not yet been disclosed (or only partially or incorrectly disclosed), and therefore it is necessary to: it is given in further development.

The review materials should be organized in a certain logical connection and Therefore, the list of works and their critical analysis is not required.-

you can only give them in chronological order of their publication. Work overview
 You should only make pre-assignments for questions on the selected topic. All skol-
 any valuable publications that are directly and directly related to
 They should be named and critically evaluated on the topic of the scientific work.

Conclusions can be drawn only after a thorough and
 comprehensive study of the literature. ratur sources.

Statement of the purpose of the research being undertaken, indication of the specific The main tasks to be solved in accordance with this goal should be:
 do this as carefully as possible, since the description of their solution should include:
 describe the content of the chapters of the scientific work. This is also important
 because the headers are the same. these chapters are born precisely from the
 formulation of the tasks of the research being undertaken. research institute.

A mandatory element of the introduction is the formulation of the object
 and subject researches. An object is a process or division that generates a
 problem system. a tour and favorites to study. An object is something that
 is located within the boundaries of an object. the project.

A mandatory element of the introduction is also an indication of the research methods
 used. research tools that serve as a tool in obtaining factual material, which are
 Being a necessary condition for achieving the goal set in such work, the following criteria
 are specified: It is important to know what specific material the work itself is based
 on. Here we also give the following characteristics: characteristics of the main sources of
 information (official, scientific, etc.). literature, bibliographic data), as well as
 methodological recommendations are indicated. fundamentals of the conducted research.

At the end of the introductory part, it is desirable to reveal the
 structure of the scientific work, i.e. give a list of its structural
 elements and justify the sequence of their distribution. regulations.

The chapters of the main part deal in detail with the methodology and technique of using
 the results are followed and summarized. The content of the chapters of the main part
 should be exactly corresponded to the subject of the scientific work and fully disclose it.

The scientific work ends with a "conclusion". This synthesis is a sequence- a clear, logically
 coherent presentation of the results obtained and their correlation with the overall situation.

The goal and specific tasks set and formulated in the introduction are: research institutes. The conclusion also presupposes the presence of a generalized final assessment of the performance of the project. It can also include practical suggestions, which increases the efficiency of the project. the value of theoretical material.

After the conclusion, a bibliographic list of the information used is placed. literature is one of the essential parts of scientific work that reflects the self - awareness of the author. effective creative work of the researcher.

Each literary source included in such a list should have the following information: introduction to the manuscript of a scientific paper.

3. Text categorization

Rubrication of a scientific work is the division of its text into its components parts, graphic separation of one part from another, as well as the use of lighting. Rubrication in scientific work reflects the logic of scientific research. Therefore, it assumes a clear division of the text of the manuscript into separate sections. efficient logically subordinated parts.

The simplest heading is a paragraph-indent to the right at the beginning of the first line each part of the text. Paragraphs are made to make your thoughts come out more clearly. it was visible, and their presentation was more complete. Correct breakdown dividing the text of a scientific paper into paragraphs makes it much easier to read and understand it.

Paragraphs of a single paragraph or chapter should be consecutive in meaning linked to each other. When working on a paragraph, pay special attention to at the beginning of it.

Each paragraph should be systematic and consistent in its content. statement of facts, comply with the internal logic of their submission, which is significantly It is largely determined by the nature of the text.

In narrative texts, the order of presentation of facts is most often determined by It is determined by their chronological sequence and semantic connection with each other.

In descriptive texts, when an object or phenomenon is revealed by translating the text, it is necessary to use the following methods: when calculating its attributes and properties, it is customary to first give a general description the described fact, taken as a whole, and only then - the characteristics of its individual elements. parts.

Division of the text of a scientific work into larger parts, their breakdown should be performed according to the logical rules for dividing the concept.

The purpose of dividing the chapters of the main part into paragraphs is to re- calculate all types of divisible concepts. Therefore, the scope of the division terms should be equal in its sum to the volume of a divisible concept. Failure to comply with this rule may result in: lead to structural errors:

- a chapter on the semantic content of the total volume of its constituent paragraphs; graphs, i.e., simply put, it includes paragraphs that are superfluous in meaning;
- the number of paragraphs that make up the chapter is insufficient in meaning. new ones.

During the entire division, the selected division attribute must remain unchanged. one and the same thing and not be replaced by another attribute. Meaning of the division terms they should exclude each other, but relate to each other as a part and a whole.

The division must be continuous, i.e. during the division process, you need to switch between go to the nearest views without jumping over them. An error that occurs when the system is broken. This rule of ethics is called the "leap in division".

The headings of chapters and paragraphs of a scientific paper should accurately reflect the content of holding the relevant text. It is not recommended to include in the title words that reflect common featuresf concepts that do not clarify the meaning of the title, and also words that are highly specialized or local terms. You can also not include abbreviated words and abbreviations in the title. chemical, mathematical, physical, and technical formulas.

Text rubrication is often combined with numerical numbering (as well as alphabetic numbering). c) denoting the sequence of arrangement of its component parts. Possible numbering systems:

- use of different types of characters : Roman and Arabic numerals, uppercase and lowercase letters. lowercase letters combined with paragraph margins;
- use only Arabic numerals arranged in certain combinations.

When using different types of signs, the numeric and alphanumeric display system is values are plotted in descending order.

A ... B...C...D...

I...II...III...IV...

1...2...3...4.....

a)...b)...c)...d)...

It is customary to indicate the ordinal numbers of parts with the words (part one), sections - capital letters of the Russian alphabet (section A), chapters-Roman numerals (chapter I), paragraphs - in Arabic numerals (Section 1).

It is acceptable to use the digital system in scientific and technical texts numbering, according to which the numbers of the largest parts of the scientific pro- results (the first stage of division) consist of a single digit, the number of composite hours- tey (second stage of division) - of two digits, the third stage of division - of three digits etc.

4. Language and style of scientific work

The scientific presentation of the material of a scientific work consists mainly of the following sections: the purpose of which is to prove the truths revealed as a result of research of the facts of reality. For a scientific text, the following features are inherent: completeness, integrity, and coherence.

The phraseology of scientific prose is very specific. It is designed to express logical connections between parts of the utterance and denote certain concepts.

In scientific texts, relative adjectives are widely used. since it is precisely such adjectives, in contrast to qualitative ones, that are able to pre- express sufficient and necessary features of concepts with reasonable accuracy.

A feature of the language of scientific papers is the fact that there is no expression. From- here, the dominant form of assessment is the statement of the characteristics inherent in the determined object. by the way. Therefore, most adjectives are here part of the term- nological expressions. Individual adjectives are used as placeholders. estates.

The verb and verb forms in the text of the scientific work are used to express the following: a permanent property of the subject (in scientific laws, regularities established by the legislation of the Russian Federation). previously or in the course of this study), they are also used in the description of research progress, evidence, in the description of devices and machines.

The indicative mood of the verb is often used, and the subjunctive is rarely used

mood, and almost no imperative mood is used at all.

In scientific speech, demonstrative pronouns "this", "that", "that- coy". They not only concretize the subject, but also express the logical connections of the subject. I'm waiting for your comment. Pronouns " something", " something", " something " in force However, their values are not used in the text.

Syntax of scientific speech. Since scientific speech is characterized by a strict logical sequence, here separate sentences and parts of a complex sentence are used. syntactic whole, all components (simple and complex) are usually very complex. closely related to each other, each subsequent one follows from the previous one or it is the next link in the narrative or rasuwaiting. So for the text scientific work that requires complex argumentation and identification of cause and effect factors. complex sentences of various types with clear-cut definitions are characteristic of these relations. syntactic relations. Complex conjunctive sentences prevail.

In a scientific text, compound words are more often found, rather than compound words. new offers. Impersonal, vaguely personal sentences in the text of a scientific paper. They are used to describe facts, phenomena, and processes. Nominative documents suggestions are used in the names of sections, chapters, and paragraphs, as well as in captions to drawings, diagrams, and illustrations.

Stylistic features of written scientific speech. Objectivity from-

This is the main stylistic feature of such speech, which follows from the specifics of the language. scientific knowledge that seeks to establish scientific truth.

A mandatory condition for the objectivity of the presentation of the material is the indication what is the source of the message, who expressed this or that idea, to whom specifically belongs to a particular expression.

In scientific speech, certain standards for the presentation of mathematics have been clearly formed. territory. The description of experiments is usually done with the help of brief sufferers. common participles.

Description of the operation of machines and mechanisms in technical scientific works. everything is done using passive constructions in which the predicate expresses- It is a verb in the passive-reflexive form.

In cases where the use of special equipment is excluded, i.e. when

the action is performed manually. The predicate is used in the form of a third character. ca is the plural of the present or past tense.

In the scientific work on technological topics, instructions for the maintenance of the machine can be found in the following sections: tires and mechanisms, or when describing other actions, requiring precise or mandatory. It is customary to use infinitive sentences to give a negative performance. which emphasize the categorical nature of the statement.

In written scientific speech, the presentation is usually conducted in the third person, since attention is focused on the content and logical sequence of the message. not on the subject. The first and second forms are relatively rarely used. the second person form of singular pronouns is usually not used. The author's "I" recedes into the background. The author of the scientific work acts in many ways: in the plural and uses "we" instead of "I".

Semantic accuracy is one of the main conditions that ensure scientific and practical accuracy. the practical value of the information contained in the text of the scientific work.

There should be no synonymous terms in a single statement. You can also not accept know for the norm the formation of a new word in a foreign language from two Russian words to a new word in a foreign language. ner. Such words do not add precision to the expression of a thought.

The accuracy of scientific speech is determined not only by the purposeful choice of words and expressions - no less important is the choice of grammatical constructions, I assume- ensuring that the communication norms in the phrase are followed exactly. Ability to explain things differently words in word combinations create ambiguity.

Clarity of scientific speech is the ability to write easily and intelligibly. In many in some cases, the lack of clarity of presentation is caused by the desire of individual authors give your work the appearance of being scientific. Hence the completely unnecessary science- an image when simple, all well-known subjects are given complicated tasks. titles. The reason for the ambiguity of the statement may also be an incorrect order words in a phrase.

Simplicity of presentation contributes to the fact that the text of the scientific work is readable easy, i.e. fast and the author is perceived without difficulty.

Brevity is the third necessary and obligatory quality of scientific speech. everything that defines its culture. In practice, this means being able to avoid unnecessary situations.-

excessive repetitions, excessive detail, and verbal garbage. Every word and expression the definition here serves a purpose that can be formulated as follows: as much as possible not only more accurately, but also shorter to convey the essence of the matter. So the words and the word-combinations that do not have any semantic load should be excluded from the text. a hundred.

Verbosity, or speech redundancy, most often manifests itself in the use of various forms of speech. research Institute of unnecessary words. To avoid verbosity, you must first of all fight with pleonasm, when words that are unnecessary in meaning are interspersed in the text.

Speech redundancy should also include the use of foreign languages unnecessarily. strange words that duplicate Russian words and thus unjustifiably increase the number of words used in the Russian language. they clarify the statement.

Tautology - repeating the same thing in other words.

Stylistic shortcomings of speech redundancy should be avoided, including: it is dominated by clerical issues that clog the language, giving it a state-owned shade. Especially often clerical issues get into scientific speech as a result of inappropriate content. the use of so-called patronymic prepositions that deprive such speech emotionality and brevity.

You can achieve brevity by using lexical and morphological methods. and syntactic ways to increase the information capacity of the text such as:

- brevity. It is achieved when transmitting the content of research projects by using the following methods: use abbreviations of words and phrases, and replace frequently repeated terms **abbreviations**.

Mixed terminological abbreviations have become widespread, condition-abbreviations, as well as abbreviations of keywords;

- laconization of the text. When describing innovations, most often use- short passive participles are used.

In complex words consisting of a numeral and an adjective, it is customary to the first part of the word should be denoted by a number, and the second part should be added with a hyphen. Shiro- If you use constructions with nouns in the genitive case, you can use the following expressions: use it as a chain to contain as much information as possible in one phrase.

It is necessary to rearrange the phrase if there is an opportunity to save at least a few rubles.-

number of printed characters. Passive-reflexive verbs are often replaced by verbs real voice or simple participles. You can also compress text This can be achieved by replacing specific concepts with shorter generic concepts.

In the text of a scientific paper, you should use only the following syntactic terms: constructs that provide the greatest savings in the means of expression. Such an eco- nomia is most often achieved by replacing complex sentences with simple sentences. niyami.

Often in the text of scientific papers, there is a need for a certain sequence. please list technological operations, labor practices, and non-technical tasks. varieties of machines and mechanisms. In such cases, complex conjunctions are used. the first part of these sentences contains words with a generalizing meaning. and in subsequent parts, the content of the first part is specified point by point. parts. At the same time, the categories of the list are constructed in the same way, like homogeneous ones members with a generalizing word in normal texts.

For the linguistic and stylistic design of a scientific work, it is important to organize the integrate the accumulated scientific information into a coherent text. To make your work easier researchers in this regard are shown below in the form of a table the speech cli- those who perform various speech functions that are used in scientific works they are used as a means of communication between sentences.

Table 1

Speech function	Lexical tools	
Cause and effect, condition and effect	(i) therefore, because, since	
	as	
	from where	should
	due to	
	as a result	
	in force in mind	} of this
	in relation to	
	in this regard, according to this	
	in this in this	in this case

	under these conditions
	under the following conditions
	(a) if (same)..., then...
	Testifies indicates says matches that gives an opportunity allows promotes has a value etc
1 _	2
Temporal correlation and location sequence	First, first of all, first of all
	first step followed by preceding
	simultaneously, at the same time, here
	along with this
	previously, previously, above
	again, again, again
	then, next, then, below
	later, later, later
	first, second, etc.
	currently, up to date
	in recent years, in recent years
Comparison and contrast	finally, in conclusion
	however, but, ah, the same
	like..., like..., just like...
	not only that, but also...
	compared to; if..., then...
	in contrast, in contrast, in reverse
	similarly, also, in the same way
	on the one hand, on the other hand
Addition OR refinement	while, meanwhile, at the same time
	however
	also and, moreover, at the same time, at the same time
	in addition over and above more
Link to previous or after-	mostly, especially
	even more so. what...
	including. in case. so. exactly
	said
	shown

blowing you- telling a story	mentioned	
	as	
	noted	
	installed	
	received	
	detected	
	found	
	it was said	
	as {	
	indicated	
	} above	
	noted	
	underlined	
	according	
	to} this	
	is conformable	
	respectively	
	according to this. in this	
	regard, in connection with the above	
	given, named, considered, and so on.	
	same, same, similar, similar, similar, similar, similar, similar type	
	next, next, some	
	many of them, one of them, some of them	
Generalization, conclusion, from here from this	most of them, most of them	
	so, so, hence	
	as a result, in the end, in the end	
	{ follows from I see clear	
this		
	allows you to make a conclusion it boils down to the following testifies to	
Illustration- what is said- nogo	finally, in conclusion	
	for example, so, as an example	
	an example would be	
	such as (for example)	
	in case, for the case	

	what can be judged that is obvious
Introduction of new information	Consider the following cases
	Let's focus in more detail on...
	Here are some examples
	The main advantages of this method are-
	Some additional notes...
	A few words about the research prospects

Practical 6. REGISTRATION OF SCIENTIFIC WORK

1. Presentation of tabular material;

2. Presentation of certain types of text material;

3. Presentation of selected types of illustrative material;

4. General rules for presenting formulas, writing symbols, and formatting use of explications.

1. Presentation of tabular material

Digital material, when there is a large amount of it or when there is a need for co-operation. setting and deducing certain regularities, formalize in the scientific work. those are in the form of tables.

A table is a way of presenting information in which digital or textual material is grouped in columns separated from each other. the other one uses vertical and horizontal rulers.

There are two types of tables based on their content: analytical and non-analytical. Analytical- These tables are the result of processing and analyzing digital indicators. Such tables make it possible to identify and formulate certain laws. license plates,

As a rule, unprocessed statistics are placed in non-analytical tables. statistical data that is necessary only for information or making a statement.

The table consists of the following elements: an ordinal number and a subject number. header, side panel, vertical graph (head) headers, horizontal and vertical columns. vertical graphs of the main part, i.e. the prograph.

The sequence number of the table is used to link it to the text. It consists of the word "table" and the numbers of its number in the scientific work. The word "table" is written with the following spelling: don't put the "no" icon before the sequence number and a dot after it.

If there is only one table in the work, then neither the numbering title, nor the word "table" is needed. In this case, the word "table" should be written in the text without abbreviating it. research institute.

If there are two or more tables in a scientific paper, they should be numbered. each of them requires a link in the text. In this case, the word "table" is used for the following purposes: drive in abbreviated form, do not put the "no" sign.

In case of repeated links in the text, it is necessary to add to the link the generally accepted fourth abbreviation for the word "look" (see).

The subject heading defines the table content and is used in if it is necessary to use it without referring to the text. Such a header, like the numbering code, it is written with a capital letter, without a dot at the end. Linksy on the table should be formulated in such a way that there is no duplication of thematic content. a specific title where you should avoid using the following words: value, calculation, and dependence.

The head is the part of the table that contains the contents of vertical columns. graph. It can consist of one or several floors (tiers).

Headings of the graph in the first tier should be written with a capital letter, at the end of which neither don't put a period or comma. Headings of graphs of the second and subsequent tiers (sub-sections). heads) are written as follows. If the tier is a single grammatical structure form with the previous tier, then use a lowercase letter to write the underlying subquery. dexterity. If the tier has an independent value, then capitalize and subheadings.

Graph headings are given in the nominative singular case. Porya- following the parts of the subtitle: definition of the value, its letter designation. comma, unit of measurement in the SI system. Identical or common parts of the sub- headings are moved to the previous level.

Multi-tiered heads should be shortened. Vertical borders should be avoided. fy "number in order". The "Note" column is allowed only in cases where: it contains data related to most of the existing tables.

Sidebar - the leftmost column that contains information about horizontal rows

and being a component of the so-called "tail" of the table, i.e. that part of it- ti, which is located below the head.

Each side page should have a title that is written in the nominative case with a capital letter and no dot at the end. Sidewall stitching must be strictly applied

obey its header. Repeated values must be grouped together.

The design of the words "including" in the sidebar has two options::

- words are written on a separate line with an indent to the right, if they are followed by more than one line;
- sideboard with the words "including". These words are written in the selection if they are followed by there is only one line.

Prograph - graphs containing data related to the head and side of the image. vika and are included in the tail of the table.

When creating a program, follow the following rules::

1. You can't use empty graphics. If there is information, and the author of the scientific work has it if it does not, then you must write "No information" (short for "No information"). If if there is no information (for an unknown reason), then put a dash sign.
2. Replace absolutely identical text information: one word-with quotation marks. two or more words - the words "The same".
3. You can't replace numbers, chemical symbols, signs, or brands.

The logic for constructing a table should be such that its logical subject, or the subject must be located in the sidewall, or in the head, or in both of them, not in the graph, but the logical subject of the table, or the predicate, is in the graph, but not in the graph. in the head or sidewall. Each heading above the column should apply to all of them. data in this column, and each row header in the sidebar - to all data in this column. strings.

All data presented in the tables must be reliable, uniform and consistent. If they are set, their grouping should be based on essential attributes.

It is not allowed to include tables in the text of a scientific paper without reference to the source. individuals whose data have already been published in the press.

Before putting any material in a table, you should decide whether to use it as a template. is it possible to present it in plain text form? Put it in a scientific paper only use tables that are difficult to convey in plain text (results). experimental observations, detailed background information, etc.).

When moving a table to the next page, the head of the table should be repeated. place the words "continuation of Table 5" above it. If the head is bulky,

it is allowed not to repeat it. In this case, the columns are numbered and repeated their numbering is shown on the next page. The table header is not repeated.

Simplified inference tables are often used in scientific papers. They are like usually, they contain sidewalls, dots, and one or two columns.

Output::

- without a title, if it is a direct continuation of the stated It is also grammatically related to the introductory phrase of the text;

- with a header, if the output has an independent value.

2. Presentation of certain types of text material

The text material of a scientific work is very diverse. To it (by- past the elements of composition and categorization discussed above) usually include numerals, alphabetic symbols, citations, references, enumerations, etc., i.e. everything something that requires knowledge of special technical and spelling rules in its design. rules.

Digital, alphanumeric, and alphanumeric forms are possible in scientific papers numerals. The digital form is used when writing quantitative numbers. legal entities with the exception of:

1) Single-digit numbers in indirect cases not in units of values or in monetary units;

2) When several numerals meet in a numeric sequence;

3) At the beginning of a sentence and especially a paragraph.

The numeric form is also used for writing ordinal numbers:

1) If they are given in Roman numerals;

2) If these are the numbers of pages, tables, illustrations, and appendices that need to be updated. preceded by the name of the numbered item;

3) If it is a date before the name of the month or the word "year";

4) If it is a series of three or more ordinal numbers (case ending), the value increases only for the last numeral;

5) If these are ordinal numbers separated by dashes.

The alphanumeric form of writing numerals is used for:

6) Multi-digit round numbers in digital form.

7) Ordinal numbers in the form of Arabic numerals-the case increases- a different ending (except in the case indicated above).

8) Complex nouns and adjectives that include numerals. It is allowed to write such words in abbreviated form.

Rules for building case endings:

- single-letter if the penultimate letter of the numeral is a vowel;
- two-letter if the penultimate letter is a consonant.

Abbreviations are a truncation of a word, as well as a part of a word or a whole word that is formed by a word. obtained by such truncation. This shortened word notation is used here with to reduce the amount of text.

There are three main ways to write abbreviated words::

- 1) Only the first (initial) letter of the word (year - year) is left.;
- 2) Leave a part of the word, discard the ending and suffix (Soviet - owls.);
- 3) Skip several letters in the middle of the word, and put a de- fis (university - un-t).

The abbreviation must end in a consonant and must not end in vowel (if it is not the initial letter in the word), the letter "i", soft and hard sign.

The scientific text contains the following types of abbreviations::

- 1) Alphabetic abbreviations.
- 2) Compound words.
- 3) Conditional graphic abbreviations based on the initial letters of the word.
- 4) Conditional graphic abbreviations for parts of the word and initial letters.

Alphabetic abbreviations are made up of the first (initial) letters. names and are divided into:

- readable by letter names (VUS);
- readable by sounds denoted by letters (university - higher educational institution). location).

In addition to the common alphabetic abbreviations, their authors are also used. tori are alphabetic abbreviations. At the same time, the first mention of such abbreviations is made

it is indicated in parentheses after the full name.
they are used in the text without decoding.

Compound words are made up of a combination of:

- 1) truncated words and full words (trade union - trade union);
- 2) only truncated words (collective farm - collective farm).

Conditional graphic abbreviations-by initial letters (n. m. t. - lower dead center).

Conditional graphic abbreviations by parts and initial letters of words:

- 1) conventional abbreviations;
- 2) conditional abbreviations accepted in the specialized literature, including in bibliographies.

Common abbreviations used after the list are:

i.e. (i.e.), etc. (and so on), etc. (and so on), etc. (and others), etc. (and other).

Conventional abbreviations used for links: see (see), cf. (compare).

Conventional abbreviations used to indicate centuries and years with numbers: century(century), centuries(centuries), year (year), years (years).

There are a number of conventional abbreviations: t. (volume), n. art. (new style), old style (old style), A.D. (AD), city(city), region(region), gr. danin), S. (pages with figures), acad. (academician), associate professor (associate professor), prof. trash).

The words "and others", "and the like", "and others " inside the sentence are not abbreviated. read more. Abbreviations of the words "so-called" (so-called), "since" (because) are not allowed. "for example "(e.g.), "about" (approx.), "formula" (f-la), "equation"- (level), " diameter" (diam.).

Letter designations - must comply with the approved standards.there and other existing regulatory documents.

Enumerations (lists) that consist of both completed and unfinished items phrases'. Incomplete phrases should be written in lowercase letters and indicated in Arabic. use numbers or lowercase letters with a semicircular closing bracket. To the entity-

there are two design options for such phrases:

- enumerations consist of individual words (or small phrases without prepositions). internal kicks), which are written in accordance with the rest of the text and separated separate by comma;

- lists consist of expanded phrases with their own punctuation marks.

Parts of an enum are most often written on a new line and separated from each other. a friend with a semicolon.

If parts of the list consist of complete phrases, they are written in the same way as the first part of the list. they are indented in paragraphs, start with uppercase letters, and are separated from each other. a friend with a dot. The text of the enumeration elements must be grammatically subordinate the main introductory phrase that precedes the list.

The main introductory phrase should not be broken off with prepositions or conjunctions (to, from, from, what, how, etc.).

The headings and subheadings given in the text should be as brief as possible. the form should reflect the subject of the text placed below them. Headings are placed above the text in the middle part of the sheet, do not put quotation marks in quotation marks, but use uppercase letters letters from the red line, don't put a dot at the end of them.

The title should be short, without unnecessary words that do not carry a specific meaning. text information. In cases where the title is very long and you need to be precise to convey the meaning contained in it, enter a subtitle, which usually includes they are placed in parentheses.

Headings range from 2 to 14 words and usually take up no more than 2 typewriters. written lines.

The title should consist, if possible, of a key.whose words. Most often these are words reflect the subject in question or give general characteristics of it- th item.

The headings do not include abbreviated words and abbreviations, as well as physical symbols. chemical and mathematical formulas.

When processing documents when their headings are unclear or very broad by default. to clarify their meaning, enter keywords in straight brackets, matching them

grammatically with the title text.

3. Presentation of certain types of illustrative material. General rules of procedure in terms of presentation and design of certain types of illustrative material, riyala

Illustrate the scientific work based on a certain general idea, according to a carefully thought-out thematic plan. Each illustration should answer the following questions: the text should correspond to the text, and the text should correspond to illustrations.

All illustrations in a scientific paper should be numbered. Numbering them it usually comes through. If there is only one illustration in the work, then it is not numbered. ruetsya.

In the text of the illustration, links are made that contain ordinal numbers, under For example, the illustrations are placed in a scientific work.

Each illustration must be provided with a caption that says: it must match the main text and the illustration itself.

The caption under an illustration usually has four main elements::

- name of the graphic plot indicated by an abbreviated word "Fig._ ";
- the serial number of the illustration, which is indicated without the Arabic number sign. in real numbers;
- thematic title of the illustration that contains text with a characteristic represented in the most concise form;
- explication, which is constructed as follows: plot details are indicated by numbers, except for then these figures are put in the signature, accompanied by text.

The main types of illustrative material in scientific research are: The results of these works are as follows: - drawing, technical drawing, diagram, photo, diagram and graph.

A drawing is the main type of illustration in engineering research papers. It is used for it is used when it is necessary to represent the layout of the equipment as accurately as possible. design of the machine, mechanism, or part thereof. Any drawing must be it is executed in exact accordance with the drawing rules and requirements of the corresponding existing standards.

A drawing in a scientific paper is primarily an illustration, which, in comparison with

the working drawing is greatly simplified, getting rid of everything that is not required to understand the design of an object or the nature of its operation or device.

The names of machines, subassemblies, and parts are usually omitted from this drawing. If by if you need to specify individual details for the text content, then they are numbered in black. use the same Arabic numerals (from left to right, clockwise). Decryption of these figures (positions) are given either in the text in the course of presentation, or in the caption under the drawing. pulp press.

Cross-sections and cross-sections in drawings, as well as arrows indicating locations projections are indicated by the letters of the Russian alphabet. In this case, the words "Cross-section" and Don't write" cut".

Photography is a particularly convincing and reliable means of visual communication. chi of reality. It is used when it is necessary for documentary purposes. accurately represent an object or phenomenon with all its individual features. notes. A photograph is not only an illustration, but also a scientific document. display of the landscape, plant or animal species, and location of map items on the map. observations, etc.).

It is possible to illustrate the scientific work with original photos in the following format: It is a proof of the existence of something in a certain place. In such cases, in tea, the image is taken from the following documents:with a matching background.

For photography in scientific work, in addition to purely technical requirements (even in the case of image quality, print quality, etc.), subordination of a single image to the general image structure. according to the overall design of the work. The general compliance requirement is specified by the function the information that the image carries.

Technical drawings are used in scientific work when it is necessary to depict a phenomenon or object as we visually perceive it, but only without any visual effects. unnecessary details and details. Drawings are usually made in axonometric format. This allows you to represent the object in the simplest and most accessible way.

With the help of a technical drawing, it is possible to draw with a high degree of clarity- change the object, shape, structure, and location of items.

A diagram is an image that usually transmits information using symbols. The main idea of any device, object, or object is not considered to be accurate and does not comply with the scale.,

a structure or process and showing the relationship of their main elements.

On the diagrams of various devices, the measuring and communication equipment ra: electrical, electronic, kinematic, thermal and other types of devices and mechanisms should be represented using the symbols specified in the table below. in accordance with the relevant standards. The thickness of the iso- displays of main and auxiliary, visible and invisible parts and thickness lines of their connections.

Complex kinematic schemes of various mechanisms of machines with a large number of It is recommended that the number of overlapping parts should be represented in the axon- metrics so that all the details and their relationships are clearly visible.

In some cases, the spatial diagrams of various image systems are represented by they are drawn as rectangles with simple links-lines. Such schemes are usually naz's They are represented by flowcharts (flow diagrams).

A diagram is one of the ways to graphically represent the relationship between values. Diagrams are made for visual clarity of the image and analysis of the scale. sov data. In accordance with the form of construction, there is a distinction between planar-linear, linear, and volumetric models. In scientific papers, the greatest number of line charts, bar charts (tape charts), and sec- paid ones.

Use a coordinate field to create line diagrams. On the axis of abscissa in the scale shown, time or factorial values are plotted. signs (independent), on the ordinate axis-indicators for a certain moment or period. time period or size of the resulting independent feature. Vertexes of the or- dinat are connected by segments, resulting in a polyline. On li- A number of metrics can be plotted simultaneously on neural diagrams.

On bar charts (ribbon charts), data is represented as straight lines. squares (columns) of the same width, arranged vertically or vertically. rhizontal. The length (height) of the rectangles is proportional to the displayed values. by their values.

If the rectangles are placed vertically, the diagram is called column-based, if placed horizontally - tape-based. Sector chart

it is a circle divided into sectors, the values of which are proportional to They are equal to the values of parts of the displayed object or phenomenon.

The results of processing numerical data can be given in the form of graphs. visual representations of quantities and their relations through geometric shapes, points, etc. ki and lines. Graphs are used for both analysis and visual enhancement. features of the illustrated material

In addition to the geometric image, the graph must contain a number of VSP'sthe extortionist- new elements:

- general title of the chart;
- verbal explanations of conventional signs and the meaning of individual graphic elements; of a specific image;
- coordinate axes, a scale with scales, and numeric grids;
- numerical data that supplements or clarifies the amount of data plotted on the map. chart of indicators.

The abscissa and ordinate axes of the graph are drawn as solid lines. On the con- don't put any arrows in the coordinates of the coordinate axes. The coordinate axes must contain symbols and dimensions of deferred values in accepted abbreviations niyah.

If the curve shown on the graph takes up a small amount of space, then to save space, you can start numeric divisions on the coordinate axes from scratch, a limit it to the values within which this function is considered. regional dependence.

4. General rules for presenting formulas, writing symbols, and formatting explications

Formula - a combination of mathematical or chemical signs that express any suggestion. Formulas have separate lines in the middle of the sheet and within text lines in the selection. The most important formulas, as well as long and cumbersome formulas containing summation signs, products, differentiations, integrations, are placed on separate lines.

The numbering of formulas also requires knowledge of some features of its design. research institute. You should number the most important formulas that are referenced in

in the subsequent text.

Ordinal numbers of formulas are indicated by Arabic numerals (in parentheses).
kah) at the right edge of the page without the formula being honed down to its number.

The numbering of small formulas that make up a single group is done on the same basis. It is combined in a single line with a single number. Numbering a group of formulas, location- placed on separate lines and joined by a curly bracket (paranthesis), performed on the right. The tip of the paranthesis is located in the middle of the group of formulas for it faces the number placed opposite the point of the paranthesis in the right direction. at the top edge of the page.

Formulas are variations of the basic formula given earlier. number with an Arabic numeral and a straight lowercase letter of the Russian alphabet, which is it is written together with the number. For example: (14a), (146).

Intermediate formulas that do not have an independent meaning and are given in the following table: used only for the output of basic formulas, they are numbered either in lowercase Russian letters. the Russian alphabet, which is written in a straight font in parentheses, or asterisks. kami in parentheses. For example: (a), (b), (c), (*), (**), (***)

End-to-end numbering of formulas is used in small works where it is numbered a limited number of the most important formulas.

When referring to a formula in the text, put its number exactly in the same line. in the same graphic form as after the formula, i.e. in Arabic numerals in parentheses- kah. For example: in formula (3.7); equation (5.1) implies...

If the reference to the formula number is located inside an expression enclosed in round brackets, then we recommend replacing them with square brackets. For example: Using the expression for [see formula (14.3)], we obtain...

A colon is placed before the formula only when it is necessary for the following reasons: punctuation rules:

- 1) the text contains a generalizing word before the formula;
- 2) this is required by constructing the text that precedes the formula.

A symbol is a symbol for mathematical or physical quantities, units of measurement for quantities and mathematical signs.

Russian, Latin, Greek, and Go letters are used as symbols.-

tic alphabets. To avoid SCPsymbol values of different values, use indexes that can be lowercase letters of Russian, Latin, and Latin letters. Russian and Greek alphabets, Arabic and Roman numerals, and strokes. They are located in indexes to the right of the symbol at the top or bottom.

When using symbols and indexes, the following must be observed: requirements:

1. The same value should be indicated in the text of the entire scientific work. identically.
2. Symbols and indexes of physical quantities and their units of measurement must correspond to the following values: comply with ST COMECON 1052-78.
3. Alphabetic indexes must correspond to the initial or most characteristic values of the the first letters of the name of the concept or quantity that it refers to index, for example: Kr-equilibrium constant.
4. The index 0 (zero) should only be used in cases that indicate that the user has been selected. initial or initial indicators.

Explication - an explanation of the symbols included in the formula. Explication it must meet the following requirements:

1. Place only after the formula that is separated by a comma.
2. Start with the word "where".
3. Place the symbols in the order they are mentioned in the formula. In formulas with fractions first explain the numerator, and then the denominator.
4. Must include all characters from a formula or group of formulas that are followed by the explication is located.

Punctuation marks are placed in the explication as follows:

1. Put a dash between the character in the decryption.
2. Within the transcript, units of measurement are separated from the text by a comma.
3. After decryption, put a semicolon before the next character.
4. Put a period at the end of the last decryption, for example:

$$V = S / t$$

where S is the path, m;

t - time, sec.

Practical 7. REGISTRATION OF SCIENTIFIC WORK

1. Use and design of quotes;
2. Links in the text and layoutcost of borrowing;
3. Compilation and design of auxiliary indexes.

1. Use and design of quotes

To confirm your own arguments, refer to an authoritative source or for a critical analysis of a particular scientific work, they cite the following sources: tats. Each citation should be accompanied by a reference to the source, bibliographic description of the source. the technical description of which should be given in accordance with the requirements of the bible. lyographic standards.

Misrepresenting the words of the cited author may distort the meaning of his words. Allowed only the following deviations are allowed:

- 1) modernization of spelling and punctuation in accordance with modern rules, if you have- the spelling of words and punctuation marks are not individual features. the author's unique style;
- 2) expansion of arbitrarily abbreviated words to full ones with the conclusion to- put the full part of the word in straight brackets, for example: s[show], t[ak];
- 3) omission of individual words and phrases in the quote, provided that, first of all, the idea the author's citation will not be misrepresented by omission and, secondly, this omission will be circumvented. marked with an ellipsis;
- 4) changing the case of the quoted words and phrases to subordinate them to the syn- the taxicab structure of the phrase where they are included.

Citation of the author is made only on his works. Only when the source is unavailable or difficult to access, and it is allowed to make use of the use a quote from the works of this author published in any publication, prefixing the bibliographic reference to the source with the words "Cited by:" or in abbreviated version of " Quoted by:".

When quoting indirectly (when retelling, when presenting the thoughts of other authors), It is necessary to state the author's thoughts as accurately as possible and to express the author's thoughts in his own words. to ensure correctness in the assessment of what is being stated, to give appropriate answers to the following questions:missing links to is- tochnik.

The citation should be neither excessive nor insufficient, as both both reduce the level of scientific work.

If the author of a scientific paper highlights some words in the quotation, he / she must specify this specifically, i.e., after the explanatory text, put an exact number. then the initials of the author of the scientific work are indicated, and the entire text consists in parentheses. The options for such reservations are as follows: *detente is ours.* - F. K., underlined by me. - F. K., *italics are ours.* - F. K...

The general technical and spelling rules for creating citations are as follows::

- the text of the quotation is enclosed in quotation marks and is given in the same grammatical form. iu, as it is given in the source, while preserving the features of the author's spelling. Scientific terms suggested by other authors are not enclosed in quotation marks. excluding cases of explicit polemics. In these cases, the expression "so" is used. called";

- if the quote completely reproduces the sentence of the quoted text, then it is it starts with a capital letter in all cases, except for one-when this quote is used. it is a part of the proposal of the author of the scientific work;

- if the quote reproduces only part of the sentence of the quoted text, then after the opening quotation marks, put an ellipsis.

A lowercase letter is also used if the quote is organically included in the list. the composition of the sentence, regardless of how it started in the source.

2. Links in the text and design of borrowings

In the course of presenting research materials, it is necessary to refer to the following tables: images, illustrations, examples, diagrams, formulas, and other elements located on the map. content conditions are not located next to the text they relate to.

Links in the text to the number of the figure, table, page, chapters are written in abbreviated form. without the " no " icon, for example: fig. 3, Table 4, p. 34, ch. 2. If the specified words if they are not followed by an ordinal number, then they should be written in full in the text. without abbreviations, for example: "the figure shows that...", "the table shows that..." and etc.

A link in the text to a separate section of the work that is not included in this section. ps, enclose in parentheses, placing the abbreviation " see " in front.

The link sign, if the note refers to a separate word, should stand directly for this word, if it belongs to a sentence (or group). sentences), then - at the end. In relation to punctuation marks, the footnote sign becomes curl up in front of them.

Links are numbered in sequential order within each page. on each subsequent page, the links are numbered again.

In order not to be accused of scientific plagiarism, you should definitely indicate in a link showing the exact source from which the loan is made.

3. Compilation and design of auxiliary indexes

Of the auxiliary indexes in scientific papers, use alphabetical- subject index and name index.

The main elements of the index are categories that include: structure of headings, subheadings, and links to page numbers of the text.

The first word of a category is usually nouns and adjectives. adjectives, but they can also be any other part of speech.

There should be no more than 10 page numbers in a single category. If the number of numbers is if the number exceeds 10, then split the category into subheadings. Verbal formula- adding headings and subheadings should allow you to quickly find a category or a subheading in the index.

Inversion (permutation) of words can be allowed in headings and subheadings for better positioning of the material. So, instead of "Probability Theory", we prefer rather, "Probability theory".

When creating indexes, you need to know that the first line of the category starts from the first line. without paragraph indentation, the second and subsequent lines - with a retraction. headings that don't start graphically are marked with a draw greater than inserting the second and subsequent lines of the category.

Headings and subheadings are given in the nominative case form (however, if inversion, the leading word can also be in the indirect case) of the singular and (re- same) plural.

Category headings can start with either uppercase or lowercase letters. subheadings - only with lowercase (unless, of course, they are proper names).

Don't use punctuation marks to mark the end of categories.

The title before the subheadings ends with a colon if there is no reference to text immediately after the title. In cases where references are made to text after the title, the colon is omitted.

The name index, or index of names, contains an alphabetical list of personal names. or other proper names.

The specificity of a named pointer is determined by its headers, which are they must consist only of proper names. Subheadings are not taken into account accepted, but strongly recommended for the division of the material.

Practical 8. REGISTRATION OF SCIENTIFIC WORK

1. Design of appendices and notes;
2. Design of the bibliographic apparatus.

1. Design of appendices and notes

An appendix is a part of the main text that has an additional value. a (usually reference) value, but is necessary for a more complete understanding of the topic definitions (copies of original documents, excerpts from reporting materials, etc.). production plans and protocols, separate provisions from the instructions and regulations previously unpublished texts, correspondence, etc.). include text, tables, graphs, and maps.

You cannot include a bibliographic list of the literature used in appendices. references, auxiliary indexes of all kinds, reference comments, etc. tags that are not appendices to the main text, but elements of the text itself. reference and accompanying apparatus of scientific work, which helps to use use its main text.

Appendices are designed as a continuation of scientific work at the last stages of its development. pages. If the volume or format of the app is large, it is designed as a self-service document. a separate block in a special folder (or binding), on the front side of which you can see the following information: swarms are given the title "Applications" and then repeat all the elements of the title page. ta of scientific work.

Each application must start with a new sheet (page) with the following information: in the upper-right corner of the word "Application" and have a thematic title. By if there is more than one appendix in a scientific paper, they are numbered in Arabic. use numbers (without the No sign), for example: "Appendix 1", "Appendix 2", etc. the walkie-talkie of the pages where applications are given should be end-to-end and continuous. press the general page numbering of the main text.

The main text is linked to appendices via links that they are used with the word "look"; it is usually abbreviated and concluded together with use a cipher in parentheses in the form: (see appendix 5).

Each application, as a rule, has its own meaning and can be used as an independent tool. use it independently of the main text.

The appendix is usually reflected in the table of contents of a scientific paper in the form of the following sections: an independent category with the full name of each appI.

Notes are placed inside the text in parentheses (as an introductory sentence). or, if such notes contain a fairly significant amount of information. the material is placed in a footnote (i.e., it is made out as a footnote), or it is distributed in the following format: believe at the end of chapters and paragraphs.

The content of the notes is very diverse. This:

- 1) semantic explanations of the main text or additions to it;
- 2) translation of foreign words, phrases, and sentences;
- 3) definitions of terms or explanation of the meaning of obsolete words;

4) information about persons, events, works mentioned or sub-mentioned by the author; displayed in the main text;

5) cross-references linking the given place of publication with its other locations. tami containing more detailed or additional information about the mentioned iom here is an object or person.

The notes are numbered either page-by-page or through (for the entire chapter). Cho sign- skis are placed in the text:

1. After the word or phrase that the note refers to;
2. At the end of the sentence, if the note applies to it as a whole;
3. Before a period, comma, semicolon, colon, dash, closing line

with parentheses and closing quotation marks, after an ellipsis, question mark, and exclamation marks and a dot as a graphic abbreviation sign that closes use parentheses and quotation marks.

2. Design of the bibliographic apparatus

The bibliographic apparatus in scientific work is represented by the bibliographic the list and bibliographic references that are drawn up in accordance with the GOST 7.1.84 "Bibliographic description of the document" and taking into account the short rules "Composing a bibliographic description "(2nd ed., additional-Moscow: Publishing House of the Book Pala- ta, 1991).

Bibliographic list - an element of the bibliographic apparatus that contains bibliographic descriptions of the sources used and is placed after the conclusion. Such a list is one of the essential parts of the scientific literature. a work that reflects the independent creative work of its author, and therefore it is necessary to It allows us to judge the degree of fundamental character of the research performed.

The bibliographic description is made directly from the work of the translator. chat or extract from catalogues and bibliographic indexes completely without any restrictions. omissions of any elements, abbreviations of titles, etc.

In a scientific paper, the bibliographic list does not include those sources that are based on which are not referenced in the main text and which were not actually used a researcher. Also excluded are encyclopedias, reference books, and scientific and technical publications. popular publications.

The alphabetical way of grouping literary sources is characterized by the fact that that the names of authors and titles (if the author is not specified) are placed alphabetically. However, you should not mix different alphabets in the same list. Foreign IS- tochniki are usually placed alphabetically after the list of all sources in the language scientific work.

Principle of placement in the list of bibliographic descriptions of sources "word by word." Records recommended to place:

1) if the first words match - alphabetically the second, etc.;

2) for several works by the same author-in alphabetical order of titles; 3) for auto- rah-namesakes - by identifying characteristics (junior, senior, father,

son - from senior to junior);

3) in case of several works of the author, written by him in co-authorship with others, - on the basis of the alphabet of co-authors' surnames.

If the bibliographic descriptions of sources are arranged alphabetically, However, their list is not numbered. Relation of bibliographic entries to the main text it is set using the author's last name and year of publication.

A bibliographic list based on the chronology of publications is appropriate when the main purpose of the study is to provide a complete list of publications. the main task of the list is to reflect the development of a scientific idea or other idea. Principle the descriptions are arranged here by year of publication.

In complex cases, the descriptions have:

- 1) descriptions under one year of publication-in alphabetical order of the authors 'and main authors' names; multiple titles (when described under the title);
- 2) descriptions in languages other than the language of the scientific work-under their year of publication. denmark after the description in the language of the dissertation in the alphabet of language names;
- 3) description of books and articles-under their year of publication, but within one year usually books first, then articles;
- 4) a description of books created independently and in collaboration-in the list of books one author (personalities) under one year first self-created, then-in co-authorship.

The form of linking records with the main text is carried out by the numbers of records in in the list, enclose it in parentheses or straight lines.

If consecutive bibliographic descriptions contain the same information, then, in the second and subsequent descriptions, they are replaced by the words "the same", "his same" etc.

A bibliographic list constructed thematically is used when there is no need to it is necessary to reflect a large number of bibliographic descriptions. Location there may be several descriptions in this list:

- 1) on the topics of chapters of works with the allocation of general works to a separate category, covering all or a significant part of the topics;
- 2) according to the headings of a particular section of the thematic classification of literature- a method that corresponds to the general topic of the scientific work.

In the thematic bibliographic list, the location of descriptions inside categories can be:

- 1) alphabetically for authors' surnames or first words of titles;
- 2) by the nature of the content;
- 3) by the type of publication and the alphabet of the authors' surnames or the first words of titles.

The form of linking the description to the main text is made by the numbers of the entries. not in the list.

The bibliographic list by types of publications is used in scientific works.

It is used to systematize thematically homogeneous literature. At the same time, they are highlighted the following groups of publications: official state, regulatory and informational structural, reference materials, etc.

Bibliographic list based on the nature of the content described-

It is used in scientific works with a small amount of research. used literature. At the same time, indicate first the general or fundamental characteristics of the other works that are placed inside according to one of the principles, then the sources of more than private, of a specific nature, located inside or as components on the general topic of the scientific work, or on its more specific issues.

Descriptions are linked to the main text here by their description numbers in the list.

Bibliographic lists are quite common in scientific papers mixed construction, when other elements are used inside the main sections of the list. other types of construction.

State standards and collections of documents

Bibliographic description of the document. General requirements and rules for composition- lenia:

GOST 7.1.84. - Introduction. 01.01.86. - Moscow, 1984. - 75 p. (System of standards for inform., bibl. and ed. to the case).

Collections of standard instructions on labor protection for forest industry workers Leningrad: Lesnaya promyshlennost Publ., 1989, 471 p. (in Russian)

Books by one, two, three or more authors

Ruzavin G. I. Nauchnaya teoriya: Logiko-metodol. analysis, Moscow: Mysl Publ., 1978, 237 p. (in Russian)

c.

Goss V. S., Semenyuk E. P., Ursul A.D. Categories of modern science: Formation and development E.-M.: Mysl, 1984. - 268 p.

Planning, organization and management of transport construction. Koroteev, T. A. Belyaev et al.; edited by A.M. Koroteev, Moscow: Transport Publ., 1989, 286 p.

Collection of one author

Methodological problems of modern science. / Comp. by A. T. Moskalenko. - Moscow: Politizdat Publ., 1979, 295 p. (in Russian)

Collection with a collective author

Continuous education as a pedagogical system: Collection of scientific works. trace. Research Institute of Higher Education / Ed. by N. N. Nechaev. - Moscow: NIIVO, 1995. - 156 p.

Materials of conferences and congresses

Problems of the university textbook: Tez. dokl. Third All-Union. scientific conference-Moscow: MISI, 1988, 156 p. (in Russian).

Abstract of the dissertation

Frolov V. V. Otechestvennoe meditsinskoe knigoizdanie [Domestic medical book publishing]. Development of the publishing sector repertoire, 1917-1995; Author's abstract. Diss. kand. filol. nauk, Moscow, 1995, 21 p. (in Russian)

Article from a newspaper or magazine

N. Raitsyn In the trenches of trade wars // Delovoy Mir , 1993, 7 Oct.

Egorova-Gantman E., Mintusov I. Portrait of a business person. rii and management practices. - 1992. - No. 6. - p. 1445.

Article from the ongoing edition

Safronov G. P. Itogi, zadachi i perspektivy razvitiya knizhnoy trgovli [Results, tasks and prospects of book trade development]. trading. Experience, probl., research 1981, Issue 8, pp. 3-16.

Yearbook article

Narodnoe obrazovanie i kul'tura [National education and Culture] // SSSR in figures in 1985, Moscow: 1986. 241-255.

Article from the encyclopedia and dictionary.

Biryukov B. V., Gasteв Yu. A., Geller E. S. Modelirovanie [Modeling].,

1974. - Vol. 16. - pp. 393-395.

Dissertation // Sovetskiy entsiklopedicheskiy slovar' [Soviet Encyclopedia], Moscow: 1985. 396.

Rules for making bibliographic references. Bibliographic reference

ka - a set of bibliographic information about the cited person, the subject under consideration or any other document mentioned in the text of the document, which is necessary for its publication. its characteristics, identification, and search.

When including description elements in the syntax of the main text, follow the rules for formatting the text, not the bibliographic description.

Between the description areas, the "dot and dash" sign can be replaced with a dot, allowing for The use of the short description form is prohibited. If the text is not quoted from the original source, if it is not based on the source, but on a different publication or document, then the link should follow start with the words "Cit. by", or " Cit. by kn. k", or " Cit. according to art."

When you can't make a smooth log from the text that the link belongs to - a quick click to the link, since the text does not explain the logical connection between them, then use the initial words "See", "See about it".

When it is necessary to emphasize that the source referred to is only one of the many that confirm, or express, or illustrate the situation, In such cases, use the words " See, for example", "See", "See", "See", "See", "See", "See", "See", " See in particular".

When you need to show that the link represents additional literature, indicate "See also". When the reference is provided for comparison, explain: "Wed."; if the work mentioned in the link covers the main issue in more detail In the text of the subject, write "For more information, see".

By location relative to the main text of the scientific work of the bibliographic links are divided into intra-text, subscript, and extra-text links. from the beginning.

Inside text links are used when a significant part of the link is entered the main text of the scientific work is so organic that it is impossible to remove it from this text. perhaps without replacing this text with another one. In this case, specify in parentheses only the output data and the page number on which the cited me is printed-

srt, or only output data, or only the page number.

Subscript links to sources are used when links are needed along the way reading, and inside the text it is impossible or undesirable to place them in a hundred places, so as not to be able to make it easier to read and not make it difficult to search for help.

In cases where the researcher provides links at the end of each page in the footnotes are used to link them to the text in the form of footnotes. asterisks or numbers. If there are more than four links, then you should not use asterisks. wooded. The footnotes should be placed in the place of the text where, according to the meaning of the the author's thought is lost.

A full description of the source is given only at the first footnote. In the following cases in footnotes, instead of the title, give a symbol, for example: "Decree. op.".

If multiple links to the same source are provided on the same page books or articles, then in the footnotes put the words "In the same place" and the page number on which they are located. which the link is being made to.

There are several ways to link the main text of a scientific paper with the description of the main text of a scientific paper. using the source. Most often, the source sequence number is used for this purpose. specified in the bibliographic list; in the main text, this number is taken in the following order: square brackets.

When pointing to the source page in the main text, the latter will also include it is placed in a square bracket. For example: [24, p. 44], which means the 24th source, 44- I am a page.

The primary subscript link includes all required elements descriptions of the book. Even if part of the elements (for example, the author's last name) contains- If they are used in the main text, it is recommended to repeat them in the link. In this case, the footnotes sign put it after the quote if the explanatory text precedes the quote or is included in the list of references. the middle of it.

When the author's last name and title are mentioned in the main text, i.e., when the author's name and title are mentioned in the main text. the first part of the analytical description is given, in the subscript link, you can limit the only the publication itself can be described, i.e., the second part of the analytical report. descriptions.

In cases where the researcher has to operate with a large number of sources are used for textual bibliographic references. Although the list is for text references, this list cannot be considered a bibliographic list. externally (due to the form of the list) and essentially (contains very often descriptions sources on the topic of scientific work, as well as sources of new materials, including put into scientific circulation by the researcher) is approaching the bibliographic level. to the list. Therefore, it makes no sense to repeat the previously described material related to characteristics of the bibliographic list.

LECTURES 9. DESIGN OF SCIENTIFIC WORK

1. Rules for reprinting a manuscript;
2. The order of protection of scientific work.

1. Rules for reprinting a manuscript

The text of the manuscript of the scientific work should be typed on a typewriter at on one side of a standard sheet of white single-grade paper, at two intervals with margins around the text. The left margin is 30 mm, the right margin is 10 mm, and the top margin is 20 mm. mm, the lower one-20 mm.

With these fields, each page should contain approximately 1800 values. (30 lines, 60 characters per line, counting each punctuation mark and the space between them). in other words, also for the printed sign).

The manuscript is reprinted strictly in a sequential order. Not allowed various text inserts and additions placed on separate pages or on the back of the sheet, and moving parts of the text to other parts places.

All pages are numbered starting from the title page. A number indicating the page sequence number, put in the middle of the upper field of the page.

Each new chapter starts with a new page. The same rule applies to other main structural parts of the work: introduction, conclusion, list of references, etc. references, applications, and indexes.

The distance between the chapter title and the subsequent text should be equal to

three intervals. The same distance is maintained between the headings of the chapter and of the paragraph. The distances between the bases of the header lines are assumed to be the same, as in the text. Don't put a dot at the end of the title located in the middle of the line. Underline headings and hyphenate words in the title is not allowed.

Phrases starting with a new (red) line are printed with paragraph indentation. from the beginning of the line, equal to five intervals.

The recommended character sizes for formulas are: uppercase letters and digits - 7-8 mm, lowercase-4 mm, exponents and indexes-at least 2 mm.

Tables, figures, drawings, graphs, photographs, both in the text and in the appendices. The calculations should be made on standard sheets of the following size: 210 × 297 MM Captions and explanations to photos and d

The manuscript, drawings, and photographs should be free of marks, pencil marks, and other materials. lines, spots, and bends.

After reprinting, the manuscript of a scientific paper should be carefully proofread.

The volume of the text of a scientific paper is not strictly regulated. It is usually located at within 80-100 pages of text printed at two intervals on standard sheets. of the selected format. In the humanities, this volume is usually 20-30 percent higher than in the rest of the world. tov more.

2. Procedure for defending a scientific paper

After completing the work on the technical design of the work, the researcher must: pay sufficient attention to the final and crucial stage - the preparation for the test. sign up for scientific work.

A fully prepared scientific paper is submitted to the scientific community for the defense. to the supervisor who reviews this work as a whole. He gave me his thoughts sets out in a written opinion. First of all, the conclusion points out the following: correspondence of the completed scientific work to the specialties and branches of science.

Then the supervisor briefly describes the work done, noting: indicates its relevance, theoretical level and practical significance, completeness, the depth and originality of the solution of the questions posed, as well as gives an assessment of the state of this type of work is difficult to protect. The written request ends. conclusion of the supervisor indicating the degree of compliance with her requirements-

s required for scientific papers.

Scientific work is subject to mandatory peer review. Designated reviewer- It is made up of specialists in the field of knowledge, on the subject of which scientific research has been carried out. scientific research. The reviewer conducts a qualified analysis of the substance and basis of the reviewed scientific work, as well as assesses its relevance the selected topic, independent approach to its disclosure, the presence of its own ability to use the methods of scientific research, the degree of objectivity, the validity of conclusions and recommendations, the reliability of the results obtained, their relevance and relevance. novelty and practical significance.

Along with the positive aspects of such work, there are also disadvantages, in particular: In particular, deviations from the logic and literacy of the presentation of the material are indicated. real money, factual errors are detected, and so on.

This document contains a reasoned critical analysis of the advantages of and shortcomings of the scientific work, is announced during the discussion of the results of its defense.

The content of the review is brought to the attention of the author and not later than one or two days in advance one day before the defense, so that he can prepare substantive responses in advance. - comments made by the reviewer.

Speaking about the evaluation of the work by the supervisor and reviewer, it is worth stopping. It should be based on the content of the concepts of "novelty", "relevance" and "practical significance". youth".

Scientific novelty in relation to the scientific work itself is a sign that there is a certain degree of scientific novelty. the presence of which gives the author the right to use the concept "for the first time" in the characterization of the results obtained by him and the study as a whole.

The concept of "for the first time" means in science the fact that there are no such results. For the first time, research can be conducted on original topics that were not previously discussed. They were studied in a particular branch of scientific knowledge.

When assessing the relevance of the chosen topic, one should not proceed from the political situation. tours in the country or the world.

When evaluating the practical significance of the chosen topic, you should know that this topic is very important. the significance depends on the nature of a particular scientific study. a research project.

If the work performed is of a methodological nature, its practical significance is determined by the following criteria: the significance may manifest itself in the publication of the main results of the study in scientific press, in the presence of certificates, acts on the implementation of research results. introduction to practice; testing of research results at scientific and practical conferences. conferences and symposia; in the use of scientific developments in the educational process. ce of higher and secondary educational institutions.

If the work is of a methodological nature, then its practical significance may vary. prove yourself in the presence of a scientifically based and proven as a result of the experimental operation of the system of methods and means of improving the economic economic, technical or social development of the country. This category also includes research projects. research institutes for the scientific substantiation of new and development of existing systems, methods and methods. funds of a particular type of activity.

If it is assumed that future research will provide scientific justification of ways to optimize labor and material resources or production processes. If it is a purely applied process, then its practical significance is limited. significance can take the following forms::

- scientific substantiation of options for directions, ways to improve the environmental conditions. and labor efficiency, basic production and non-production costs. funds, material, fuel and energy resources, and other factors related to social and economic activities of the association, department, organization;
- economic justification of measures for the use of scientific and technical resources; achievements in various fields of science and practice;
- development of advanced technologies and new technical devices and implementations of implementation of these developments in the practice of specific branches of the national economy.

Completed work together with the supervisor's report and review the expert is submitted to the Council.

The main document prepared for the defense by the researcher himself, which is It is read out (or retold) at a meeting of the State Attestation Commission. It is a summary of the report.

The quality of the report summary determines the assessment not only of the work itself, but also of the quality of the report summary. all the master's student's work on it.

Preparation of the applicant for the defense begins with work on the speech on the re-based on the results of a scientific study (report) designed to reveal the essence, theory, and theoretical and practical significance of the results of the work carried out.

Structurally, the report can be divided into three parts, consisting of categories, each of which is a separate semantic block. although, in general, they are logically interrelated and represent a unity that is integrated into the whole system. kupno characterizes the content of the conducted research.

The first part of the report mainly repeats the introduction to scientific work. 3. The headings of this part correspond to the semantic aspects that apply to which characterizes the relevance of the chosen topic, and describes the scientific topic. problems, as well as the formulation of the purpose of scientific work. Here you can also specify the following methods: methods used to obtain the actual material, as well as to characterize the results of the study. its composition and general structure.

The introductory part is followed by the second, largest part in terms of volume. the sequence established by the logic of the conducted research is characterized by rizes each chapter of a scientific paper. At the same time, special attention is paid to final results. Critical comparisons and evaluations are also noted.

The report ends with the final part, which is based on the text of the report. conclusions of scientific work. Here it is advisable to list the general conclusions from it use the text and put together the main recommendations.

The text of the report may be accompanied by additional materials that they are necessary to prove the propositions put forward and justify the conclusions made. conclusions and suggested recommendations.

When the text of a speech at the defense of a scientific paper is compiled, it is advisable to prepare written responses to questions, comments, and suggestions that are relevant to the project. they are kept in the official opponent's response to it, and then draw up written comments. answers to all questions and comments contained in his review.

Dol responsesThey should be concise, clear, and well-reasoned. If if links to the text of a scientific paper are possible, then they must be made. This gives your answers the most convincing effect and at the same time allows you to emphasize your answers. to assess the reliability of the results of the study.

When preparing for the defense, it is advisable to carefully flip through the entire list again. text, make the necessary marks on the pages, attach bookmarks to the necessary places. Special attention should be paid to analytical tables, graphs and diagrams, containing the most significant results in a clear and concentrated form. review of the job applicant's progress. It is desirable to prepare some of these materials. edit for demonstration purposes. They are designed so that the applicant can: demonstrate them without much difficulty, and they were visible to everyone present. let's go to the gym.

The defense of scientific work is made publicly. It has the character of a scientific discussion. jobs and takes place in an environment of high demands, principles and compliance with scientific ethics, with a thorough analysis should be subject to: reliability and validity of all conclusions and recommendations of the scientific and practical of a specific nature, contained in the work.

The session begins with the Chairman announcing the defense of the RA- the author's name, surname, and patronymic, as well as the reporter's name. information about the availability of the necessary documents in the case file.

Then the chairman gives the floor to the scientific supervisor. in his speech, the supervisor reveals the performer's attitude to during the period of scientific research, as well as affects other aspects of the questions about his identity. If the scientific supervisor is not present at the meeting, Chairman of the Board of Directorsthe speaker reads out his / her written opinion on the implementation of the project. completed work.

Then a word to communicate the main results of the scientific research of the pre-delivered to the researcher himself. He builds his speech on the basis of reading pre-prepared abstracts of the report, designed to show its high level of efficiency. a high level of theoretical training, erudition, and the ability to present the main ideas in an accessible way. new scientific results of the conducted research.

Introducing all those present in the hall with the text of his report, the researcher it should focus on the main results of the study. based on new theoretical and applied positions that they personally need to apply. developed.

If necessary, you should make references to additional prepared documents, drawings, tables, and graphs. It is also possible to use specially prepared video clips, posters, etc.

All materials submitted to diagrams and drawings must be designed in such a way that- if the speaker could demonstrate them without much difficulty, and they were visible to all present in the hall.

The content of the report text, the nature of its reading (or retelling), etc. the number of answers to the questions asked largely determines the assessment of the task. shields.

Speech should be clear, grammatically accurate, confident, understandable, and convincing. telnaya street. The researcher should set himself the task of making a strictly scientific report. well-reasoned in terms of content. The speech should be not only clear, but also clear. It can be strong and confident, but also expressive, which depends on the tempo, volume, and intonation. If you speak hurriedly, swallowing the endings of words, or very quietly and indistinctly, then the quality of the speech from this is sharply reduced. Calm, a leisurely manner the presentation always appeals to the audience.

It is absolutely unacceptable to violate the so-called norms of literary production. wear and tear, in particular, the use of incorrect accents in words.

The researcher makes his report while standing on the podium, paying attention to the following topics: use the power of a pointer to any objects depicted on posters or drawings. if necessary, he comes down from the rostrum to write some formulas on the dossier. ke, explain the features of the exhibit.

After the speech, the chairman reads out a review of the work performed the official opponent and gives the floor to its author to answer his / her question. your expectations and suggestions.

After that, a scientific discussion begins, in which they have the right to participate all present at the defense. They can ask any questions verbally on the issues raised in the report, research methods, clarify the results and the procedure of experimental work, etc.

When answering their questions, you need to touch only on the merits of the case. To the researcher you should show modesty in evaluating your research results and be tactful to others.

asking questions. Before answering a question, you should read it carefully. listen to it and record it. It is advisable to answer the question immediately, and not just by listening to it. ask all the questions and then answer them. Keep in mind that a clear, a logical and well-reasoned answer to the previous question may exclude the possibility of next.

At the end of the discussion, the author may be provided with the following information: a final word, after which we can assume that the main part of the procedure is the defense system is finished.

Then the results of the defense are summed up, and a decision is made on its evaluation. This is a re- the decision is made by secret ballot of the members of the Board of Directors (comm.issii), I participate- participating in the meeting. The chairman then announces the results to all present voting results, notifies that the applicant is being awarded an academic degree and closes meeting.

Conclusion

Preparing a research paper is a complex creative process. It is clear that in a short course of lectures, it is impossible to consider all its aspects with equal completeness. Therefore, you inevitably have to give preference to something. According to this in this publication, the main object of consideration was mainly the following issues: issues related to the methodology of scientific creativity and work on the manuscript. They were the ones who received the most attention.

The course of lectures does not contain ready-made recipes for all cases of scientific creativity. All the tips and recommendations given in it are the most general, and they should be taken into account. individual adjustments in accordance with the nature and subject area of the project. focus of the scientific work performed.

**MINISTRY OF SCIENCE AND HIGHER EDUCATION
OF THE RUSSIAN FEDERATION
Federal State Autonomous Educational Institution
higher education NORTH
CAUCASUS FEDERAL UNIVERSITY**

**METHODOLOGICAL RECOMMENDATIONS
ORGANIZATION OF INDEPENDENT WORK OF THE STUDENT**

by discipline

Lectures on advanced developments in the field of electronic communications

information engineering

Training area

02.04.01 Mathematics and Computer Science
Training Program for Electronic Information

Orientation (profile)

Stavropol – 2019

content

1. Independent work as the most important form of the educational process
2. Goals and main objectives of the SRS
3. Types of independent work
4. Organization of the SRS
5. General recommendations for organizing independent work
6. Independent work of a student is a necessary link in the formation of a career. research areateacher and specialist

1. Independent work as the most important form of the educational process.

Independent workplanned educational program, training center, etc. research, research work of students, performed during extracurricular (classroom) hours on a task and when methodological guidance of the teacher, but without his direct participation participation (with partial direct participation of the teacher, leaving a leading role for the students ' work).

Independent work of students in higher education institutions is an important type academic and scientific activities of the student. Independent work students play a significant role in the rating technology of training. The state standard provides, as a rule, 50% of the hours from general labor intensity of the discipline for independent work of students (hereinafter referred to as the SRS). In this regard, training at the university includes two, almost identical parts of the business process in terms of volume and mutual influence learning and self-learning process. Therefore, the SRS should become effective and purposeful work of the student.

The concept of modernization of Russian education defines the main tasks of professional education - " training a qualified employee of the appropriate level and profile, competitive in the labor market, competent, responsible, fluent in their profession and oriented in related fields a person who is capable of effective work in the field of activity. at the level of world standards, ready for continuous professional development. growth, social and professional mobility".

It is impossible to solve these problems without increasing the role of self-employment. students ' work on educational material, strengthening responsibility prepoteachers for the development of independent work skills, for stimulating students ' professional growth, fostering creative thinking activities and initiatives.

The society makes enough demands on a modern specialist a wide range of requirements, among which the following is of no small importance: graduates have certain abilities and abilities independently extract knowledge from various sources, systematize the information received, give an assessment of the specific situation. financial situation. The formation of such a skill takes place during the entire period of study through students' participation in practical classes, performing control tasks and tests, writing coursework and other tasks. final qualification papers. At the same time, independent work students play a crucial role in the entire learning process.

The forms of independent work of students are diverse. They these include:

study and systematization of official state documents.
documents - laws, resolutions, decrees, regulations, etc.
reference materials using information and search engines
systems "Consultant-plus", "Garant", global network "Internet";

* study of educational, scientific and methodological literature, materials periodicals with the use of electronic official media, statistical, periodical and scientific information;

preparation of reports and research papers, writing term papers and graduation papers qualification works;

participation in student conferences, comprehensive research projects, etc. research.

Independent work introduces students to scientific creativity, search for and solve actual modern problems.

2. Goals and main objectives of the SRS

Leading goal of the organization and implementation of the SRC must match with the purpose of a student's education is to prepare a specialist and bachelor's degree with higher education. education. When organizing an SRS, an important and necessary condition is - formation of independent work skills for acquisition knowledge, skills and opportunities to organize educational and scientific activities activities.

The goal of students ' independent work is to master the following skills: basic knowledge, professional skills and abilities professional activity, creative and research experience activities. Independent work of students contributes to the development of independence, responsibility and organization, creativity approach to solving problems at the academic and professional level.

The objectives of the SRS are:

systematization and consolidation of the obtained theoretical knowledge and practical skills of students;

deepening and expanding theoretical knowledge;

formation of skills to use regulatory, legal, reference documentation and special literature;

* development of students ' cognitive abilities and activity: creative initiative, independence, responsibility and organization level;

formation of independent thinking, ability to self-development, self-improvement and self-realization;

developing research skills;

use of material collected and obtained in the course of independent classes at seminars, practical and laboratory courses

classes, when writing term papers and final qualification papers, for effective preparation for final tests and exams.

3. Types of independent work

in _educational process of higher professional education
In an educational institution, there are two types of independent work: - classroom, under the guidance of a teacher, and extracurricular. Cramped the relationship of these types of work provides for differentiation and the effectiveness of the results of its implementation depends on the organization, content, logic of the educational process (intersubject relations, advanced knowledge, etc.):

Classroom independent work on the discipline is performed at the following levels: training sessions under the direct supervision of the teacher and on the basis of his task.

Extracurricular independent work is performed by the student in the following areas: according to the teacher's task, but without their direct participation.

The main types of independent work of students without participation teachers are:

formation and assimilation of the content of the lecture notes on based on the academic literature recommended by the lecturer, including: informational educational resources (electronic textbooks, electronic libraries, etc.);

writing research papers;

preparation for seminars and laboratory works, their implementation and implementation. decoration;

* creating an annotated list articles from _ relevant journals by branches of knowledge (pedagogical, educational, etc.). psychological, methodological, etc.);

preparation of article reviews, manual;

performing micro-surveys;

preparation of practical developments;

completing homework tasks in the form of solving individual tasks. tasks, performing standard calculations, computer-based calculations, etc. individual works on individual sections of the content of disciplines etc.;

computer-based ongoing self-monitoring and control
academic performance based on e-learning and certification tests.

(Depending on the CCAfaculty specialties listed types of work they can be extended or replaced with specific ones).

The main types of independent work of students with the participation of teachers are:

ongoing consultations;

colloquium as a form of control over the development of theoretical knowledge content of disciplines: (during the consultation hours provided for by the Legislation of the Russian Federation) the curriculum);

reception and analysis of homework assignments (during practice hours classes);

acceptance and protection of laboratory work (during the course of the research). l/r);

execution of coursework (projects) within the framework of disciplines (management, consulting and defense of coursework (during the hours, provided by the curriculum);

accomplishment educational and research activities works (management, consulting and protection of R & D services);

- completion and registration of practical training results (management and assessment of the level of professional development skills and abilities);

performing graduation qualification work
(manual, consulting services and _protectionproms
qualification works), etc.

4. Organization of the SRS

The method of organizing students ' independent work depends on structure, nature and features of the discipline studied, the amount of hours for its study, the type of tasks for students ' independent work, individual qualities of students and conditions of educational activity.

The process of organizing students ' independent work includes: include the following steps::

preparatory (defining goals, drawing up a program, etc.)
preparation of methodological support, preparation of equipment);

basic (program implementation, use of search techniques
information, assimilation, processing, application, transfer of
knowledge, recording of results, self-organization of the work process);

final (assessment of the significance and analysis of the results, their
significance). systematization and evaluation of the effectiveness of the program
and methods of work, conclusions about the areas of labor optimization).

The organization of independent work of students is provided by:
faculty, department, educational and methodological
departments, teacher, library, TSO, IVT, publishing house, etc.

Students ' skills development activities academic independent work.

In the course of independent work, the student acquires the following skills: self-organization, self-control, self-management, self-reflection and becomes an active independent subject of educational activity.

Performing independent work under the supervision of a teacher the student must:

- master the minimum amount of content that is taken out for independent work. work of students and proposed by the teacher in accordance with the State-owned companies educational services standard higher education level professional education standards (State Higher Professional Education Standards/State Higher Professional education standards) in this area discipline.
- plan independent work according to the schedule independent work suggested by the teacher.
- the student should carry out independent work in the following areas: organizational forms provided for in the curriculum and working group the teacher's program.
- perform independent work and report on its results. results in accordance with the schedule of presentation of results, types and deadlines for reporting on students ' independent work.

a student can:

in excess of what the teacher suggested (if justified). And _ in accordance with it) and the minimum of mandatory content determined by the Legislation of the Russian Federation. State Higher Professional Education/State Higher Professional education in this discipline:

- independently determine the level (depth) of development content of the material;
- prevadd additional topics and questions for self-study developments;

– within the general schedule of independent work performance offer a reasonable individual execution and reporting schedule based on the results of independent work;

- offer your own variants of organizational forms of independent work. works;

- use teaching aids for independent work, training manuals developed in excess of the list suggested by the teacher;

- use not only control, but also self-monitoring of results independent work in accordance with the methods of self-control, suggested by the teacher or selected independently.

Students ' independent work should have an important impact on the formation of the future specialist's personality, it is planned to as a student independently. Each student independently determines the mode of their work and the measure of labor spent on mastering the educational process. content for each discipline. He does extracurricular work according to a personal individual plan, depending on its preparation, time and other conditions.

5. General recommendations for organizing independent work

The main form of independent work of a student is studying summary of lectures, their supplement, recommended literature, active participation in the conference. participation in practical and seminar classes. But for a successful training program activities, its intensification, should take into account the following: subjective factors:

1. Knowledge of school program material, availability of a solid the system of gaps required for mastering the main university courses. it is especially important for mathematical disciplines. You must distinguish between knowledge gaps that make it difficult to learn new materialala, from small

abilities. Having spent the effort to overcome these gaps, the student he will provide himself with a normal academic performance and believe in his abilities.

2. Availability of skills and knowledge work:

a) ability to take notes during lectures and when working with a book;

b) knowledge of logical operations: comparison, analysis, synthesis, generalization, definition of concepts, rules of systematization and classification.

3. Specifics of cognitive mental processes: attention, memory, speech, observation, intelligence and thinking. Poor development each of them becomes a serious obstacle to learning.

4. Good working capacity, which is provided by a normal physical condition. After all, serious teaching is a big lesson. multi-faceted and diverse work. The training result is not evaluated the amount of information provided, and the quality of its assimilation, the ability to use it use and develop your ability for further development independent education.

5. Compliance of the chosen activity, profession with individual requirements abilities. It is necessary to develop the ability to self-regulate your own emotional state and eliminate circumstances that violate the business plan mood that interferes with the planned work.

6. Mastering the optimal work style that ensures success in the following areas: activities. Alternation of work and pauses in work, periods of rest, individually justified rate of sleep duration, preference evening or morning classes, stress tolerance in exams, etc. features of preparing for them,

7. The level of requirements for yourself, determined by the current situation self-assessment.

An adequate assessment of knowledge, strengths, and weaknesses is important a component of a person's self-organization, without it it is impossible to be successful work on the management of svrtheir behavior and activities.

One of the main features of higher education is that the permanent external control is replaced by self-control, an active role in learning belongs not so much to the teacher. teacher, how old is the student.

Knowing the basic methods of scientific organization of intellectual labor, you can do it with the least amount of time, money, and effort achieve the best results.

The effectiveness of assimilation of incoming information depends on working capacity of a person at one time or another of his activity.

Working capacity - a person's ability to work with a high degree of efficiency. the degree of tension over a certain period of time. Distinguish between internal and external health factors.

Internal health factors these include intellectual characteristics, willpower, health status.

To external users:

- organization of the workplace, work and rest regime;
- level of labor organization - ability to get a certificate and use information;
- the amount of mental load.

The outstanding Russian physiologist N. E. Vvedensky singled out the following conditions of mental activity productivity:

- you need to enter into any work gradually;
- measurement and rhythm of work. It is more or less inherent in different people different pace of work;
- the usual sequence and systematic nature of activities; - correct alternation of work and rest.

Rest does not involve mandatory complete inactivity. On the other hand, it can be achieved by a simple change of business. performance changes during the day. The most fruitful

this is the morning time (from 8 to 14 o'clock), and the maximum working capacity falls on the period from 10 to 13 hours, then afternoon-from 16 to 19 hours) and evening (from 20 to 24 hours). Very difficult-to-understand material is best studied at the beginning of each segment time (preferably in the morning) after a good rest. After 1-1.5 hours need breaks of 10-15 minutes, after 3-4 hours of work rest should be long - about an hour.

An integral part of the scientific organization of intellectual labor is mastering the technique of intellectual labor.

A physically healthy young person with a good reputation for training and normal abilities, must, as a student, give 9-10 hours a day to study (including 6 hours at the university and 3-4 hours at home). Any subject cannot be studied several days before the exam. If a student works systematically every year, they will quickly remember everything, it will restore what you forgot. If the preparation was carried out in an emergency, then the student did not have there will not even be a general idea of the subject, he will forget everything passed.

You should make it a rule to study daily, starting from the first day the semester.

The time available for the student to complete the curriculum, it consists of two components: one of them is classroom work in the classroom. the other is extracurricular independent work. Tasks and materials for independent work are issued during the following periods: training sessions are scheduled, and the teacher is also present at the same classes supervises independent work, as well as provides support to students. help students organize their work correctly.

To complete the entire volume of independent work, you must: practice for 3-5 hours daily. Start independent projects extracurricular classes should be held from the first days of the semester, missed days will be lost irrevocably, compensate for them later with reinforced ones keep busy without reducing the quality of work and its productivity

impossible. The first days of the semester are very important for getting involved start working, set a certain order, a uniform rhythm for the entire day. term.

Rhythm in work is a daily independent activity, preferably on one day at a time. and the same hours, if it is advisable to alternate classes with breaks for rest. Initially, in order to organize rhythmic work, you need to conscious exertion of the will. As soon as a person is involved in the work, compulsion is reduced, a habit arises, and work becomes more difficult. a need.

If the order in the work and its rhythm are set correctly, then the student is able to it can work from day to day without reducing its productivity and does not overloading yourself. The correct change of one type of work to another allows you to rest without stopping working.

Thus, the first task of the organization is extracurricular independent work is the creation of a schedule that should reflect the time of classes, their nature (theoretical course, practical exercises). classes, graphic works, reading), breaks for lunch, dinner, rest, sleep, travel, etc. The schedule does not determine the content of the work, its duration, etc. the content will inevitably change throughout the semester. The order is the same it should be fixed for the entire semester and every effort should be made to keep it unchanged (except for fixing scheduling errors, which may occur due to an underestimation of the amount of work or overestimation of their own strength).

At monotonous work, a person gets more tired than at work different characters. However, it is not always advisable to engage in many activities academic subjects on the same day, since each time you click through I need to focus my attention again, this can lead to a loss of time. It is most advisable to work on no more than two or three tasks a day disciplines.

When starting a job, you don't need to try to do the hardest part first. part, you need to choose something average in difficulty, then move on to more difficult levels. hard work. And finally leave the easy part, which requires not so much more intellectual effort than certain motor skills. actions (drawing, plotting, etc.).

Independent classes will require intensive mental work, which should not only be properly organized, but also stimulated. At the same time, it is very important to be able to maintain a steady attention to the material being studied. Developing attention requires significant volitional skills. effort. That is why, if a student notices that they are often distracted during their work, they will be able to it's time for self-study, and he needs to force himself to focus. This procedure must be performed constantly, as it is it is an attention training program. Sustained attention appears when when a person treats a case with interest.

You should properly organize your classes by time: 50 minutes - work, 5-10 minutes-break; after 3 hours of work, break-20-25 minutes. Otherwise, increasing fatigue will lead to instability of attention. Very a significant factor affecting the improvement of mental activity working capacity, are systematic physical activity classes by culture. The organization of active recreation provides for alternation mental and physical activity, which completely restores human performance.

6. Independent work of a student is a necessary link in the formation of a career.

researcher and specialist

Progress of science and technology, information technologiesth leads to a significant increase in scientific information, which requires more than high demands are placed not only on moral and ethical qualities human rights, but especially the ever-increasing demands in the field of

education – updating and modernization of general and professional schools knowledge and skills of a specialist.

All education should act as a dynamic process, inherent in a person and continuing throughout his life. Mastering a scientific field the idea and language of science is a necessary component in self-organization of a future research specialist. Under this it is understood not so much the accumulation of knowledge as the mastery of scientific knowledge. reasonable ways to purchase them. This, generally speaking, consists of the main task of the university.

Specifics of the university educational process, in the organization of which independent work of the student is given more and more space, consists in the fact that that it is, as it were, the last and most adequate link for implementation of this task. Because while studying at the university, the development of style, skills of educational (cognitive) activity, rational approach to the development of professional skills. the nature of which will contribute to the constant updating of knowledge a highly qualified university graduate.

However, there are certain difficulties along this path, including: in particular, the transition of a student from a synthetic learning process in secondary school school, to the analytical level in the higher school. This is related to both the new content training (expansion of general education and deepening of professional activity). training), as well as with new forms of training that are still unknown: (lectures, seminars, laboratory classes, etc.). The student receives not only the knowledge provided by the program and study guides, but it also must posnakochoose ways to acquire knowledge so that you can evaluate what we know, how we know it, and how we achieved this knowledge. They come to all this through their own independent work.

This is also because self-acquired knowledge is an essential part of learning. more operational, they become personal property, and motivation of behavior, develop intellectual traits, attention, observation skills, criticality, and the ability to evaluate. The role of the teacher in

mainly consists in guiding the accumulation of knowledge (in relation to first-year students), and in subsequent years of study, in senior years, in jointly identifying problems and taking care of independent searches students, as well as monitoring their activities. Note that you can not limit yourself only to the acquisition of knowledge. with the program of the discipline being studied, it is necessary to constantly deepen the acquired knowledge. knowledge, focusing it on some narrow specific area, relevant to the student's interests. In-depth study of all in practice, it is possible to study the subjects provided for in the program, and a good organization of work allows you to save time, which creates conditions for a deep, systematic, and interested study of self-development. based on the topic chosen by the student.

Of course, all the tips, examples, and recommendations in this area given by by a teacher, or by certain publications, or by others sources that do not guarantee any success without showing their own active in this business, i.e. they do not give ready-made recipes, but should contribute to the analysis of your own work, its goals, and organization in the following areas: according to individual characteristics. Considering personal data opportunities, existing living conditions, etc.and and jobs, skills, based on these recommendations may need to be developed individually justified. a set of methods, ways to find your own style or improve it use it so that after studying a certain material, you can have time to evaluate it its relevance, suitability, and potential applications, so that, in the end, to ensure the success of their studies with a future professional career. activities

7. Methodological recommendations for students on individual forms

independent work.

From the very first days of September, the student is hit by a huge explosion. the amount of information you need to learn. Required content

it is contained not only in lectures (remember it – this is only a small part tasks), but also in textbooks, books, and articles. Sometimes there is a need attract Internet information resources.

The system of higher education implies a significantly larger students' independence in planning and organizing their own activities. It can be very difficult for yesterday's student to do this: if at school the daily control of the teacher forced you to constantly if you need to regularly prepare for classes, then at the university the question of the level of knowledge comes up close to the student only during the session. This is the situation it turns out to be a temptation for some to devote the entire semester to free education. time spent ("I'll learn it when I need it!"), and when it comes it's time for exams, there's so much material to be learned, that no memory is able to handle it in the remaining period time.

Working with a book.

When working with a book, you need to choose literature and learn how to read it. read it correctly, keep records. For selecting literature in the library alphabetical and system-based format is used. mathematical catalogs.

It is important to keep in mind that rational book - reading skills are always important. great time and effort savings.

The correct selection of textbooks is recommended by the teacher, giving a lecture course. The required literature can also be it is indicated in the methodological developments for this course.

When studying the material in the textbook, you should proceed to the following only after correctly understanding the previous question, describing on the use all calculations and calculations (including those in the textbook). omitted or given in lectures for independent output).

When studying any discipline, a large and important role is played by independent individual work.

Particular attention should be paid to the definition of basic concepts of the course. The student should analyze in detail the examples that explain such definitions, and be able to build similar examples yourself. You need to get an accurate idea of what you are studying. Useful make reference notes. When studying the textbook material it is useful to supplement the summary in a notebook (in specially designated fields). lectures. In the same place, you should mark the questions that the student has selected for the following tasks: consultations with the teacher.

Conclusions obtained as a result of the study are recommended in the following sections: highlight notes so that they are better when rereading entries they were remembered.

Experience shows that many students benefit from drawing up a worksheet reference signals containing the most important and most frequently used parameters. formulas and concepts used. This sheet helps you remember formulas, the main provisions of the lecture, and can also serve as a constant a reference book for students.

There are two types of reading: primary and secondary. Primary - these careful, unhurried reading, where you can stop at difficult places. After it, there should not be any incomprehensible ones left tin. The content may not always be clear after the initial reading.

The task of secondary reading is to fully assimilate the meaning of the whole (by counting this reading may not be the second, but the third or fourth).

Rules for independent work with literature.

As already noted, independent work with textbooks and books (a also, an independent theoretical study of the problems identified by as a teacher at lectures) – this is the most important condition for the formation of your own personal skills. scientific method of cognition. The main tips here can be summarized as next:

* Make a list of books that you should read. "don't try to remember everything that you won't need in the near future, –

advises the student and young scientist G. Selye, - just remember where it is you can find it" (Selye, 1987, p. 325).

- The list itself should be systematized (which means that it is necessary for seminars, what is needed for exams, what is useful for writing course papers and theses, and what interests you beyond the official program? learning activities, that is, what can expand your overall culture...).

- * Be sure to write out all output data for each book (if necessary). when writing term papers and theses, this will save a lot of money time).

- * Figure out for yourself which books (or chapters of books) you should read. read it more carefully, and just view which ones.

- When compiling literature lists, consult with teachers and academic supervisors (or even with more than well-trained and erudite fellow students) who will help you it is better to find out what you should pay more attention to, and for what don't waste your time at all...

- * Of course, all books, textbooks, and articles you read should be followed take notes, but this does not mean that you need to take notes on "everything in a row": you can write out briefly the main ideas of the author and sometimes give them the most striking and revealing quotes (with page references).

- If the book is your own, then you can do it in the margins of the book short notes or at the end of the book, on empty pages, just do your own "subject index", where you can find the most interesting ones for you thoughts and pages must be specified in the author's text (this is very important). a good tip to save time and quickly find your way around "favorite" places in various books).

- If you haven't worked much with scientific literature before, you should develop the ability to "perceive" complex texts. the best technique is to learn to "read slowly" when you understand each word.

read word (and if the word is unfamiliar, then either with the help of a dictionary, or with the help of a teacher, be sure to learn it), and this may take a long time considerable time (for some – up to several weeks or even months); experience shows that after this, the student somehow "miraculously" begins to literally to swallow books and almost see "through the cover" is a worthwhile job or not...

- "Either read or flip through the material, but don't try read quickly... If the text interests me, then reading, thinking, and even fantasizing about it merges into a single process, while forced speed reading not only does not contribute to the quality of reading, but also it doesn't bring the sense of satisfaction that we get from thinking about read it, " advises G. Selye (Selye, 1987, pp. 325-326).

* There is another optiona new way to optimize your familiarity with scientific literature – you should get carried away with some idea and all the books view it from the point of view of this idea. In this case, the student (or young scientist) will sort of look for arguments "for" or "against" the idea that interests him, and at the same time he will sort of communicate with by the authors of these books about their ideas and thoughts... The only problem is how to find "your" idea...

Reading a scientific text is a part of cognitive activity. Its purpose is to extract the necessary information from the text. Depends on how much the reader is aware of their own internal attitude when referring to the printed word (find the necessary information, assimilate the information completely or partially, critically analyze the material, etc.) in many ways the effectiveness of the action depends.

There are four main attitudes in reading a scientific text::

1. information and search engine (the task is to find, highlight the desired information). information)

2. assimilating (the reader's efforts are aimed at ensuring that both you can better understand and remember how the information presented by the author itself, so does the whole logic of his reasoning)

3. analytical and critical (reader strives critically make sense of the material by analyzing it, determining your attitude to it. to him)

4. creative (creates a reader's readiness in one form or another – as a starting point for your reasoning, as an image for action on analogies, etc. – use the author's judgments, the course of his thoughts, the result observations, the developed methodology, supplement them, subject them to a new one verification).

With the presence of various settings for accessing a scientific text the existence of several types of reading is also connected:

1. bibliographic – viewing catalog cards, recommendation lists, summary lists of journals and articles for the year, etc.;

2. pageview – used to search for content that contains
If you need the necessary information, it is usually used immediately after working with the site. lists of references and catalogs, as a result of such viewing, the reader will be able to sets which sources will be used in the future working hours;

3. introductory – implies a solid, fairly detailed description reading selected articles, chapters, individual pages, and goals get acquainted with the nature of the information, find out what questions were submitted by the author for review, sort the material;

4. student-assumes a thorough development of the material; in the course of such reading shows the reader's trust in the author and willingness to accept the author's opinion. the specified information is set to the maximum possible value. understanding the material;

5. analytical-critical and creative reading – two types of reading they are close to each other in that they participate in solving research problems. tasks. The first of them involves directed critical analysis, such as the information itself, as well as the ways in which it is received and submitted by the author. search for those judgments, facts on which or in connection with which, the reader considers it necessary to express their own thoughts.

Of all the types of reading considered, the main one for students is learning – it allows you to work with educational literature accumulate knowledge in various fields. That's why this particular view reading as part of a learning activity should be mastered first queue. In addition, when mastering this type of reading, the following forms are formed: basic techniques that improve the efficiency of working with scientific texts.

The main types of systematic recording of what you read:

1. Annotatorovanie – extremely short and coherent description viewed or read a book (article), its content, sources, nature and purpose;
2. Planning – a short logical organization of the text, revealing the content and structure of the studied material;
3. Tezirovanie – concise reproduction of the main topics author's statements without using actual material;
4. Citation – verbatim extract of excerpts from the text, extracts that most significantly reflect a particular idea of the author;
5. Synopsis – a brief and consistent presentation the content of what you read.

A synopsis is a complex way of presenting the content of a book or article in an online format. a logical sequence. The synopsis accumulates the previous ones types of recording, allows you to comprehensively cover the content of a book or article. Therefore, the ability to make a plan, theses, make extracts and other notes defines the technology of composing a synopsis.

Guidelines for composing a synopsis:

1. Read the text carefully. Find out more in the help page obscure words in literature. When recording, do not forget to make reference notes data for synopsis fields;
2. Highlight the main thing, make a plan;
3. Briefly state the main provisions of the text, mark the author's reasoning;
4. Take notes on the material, clearly following the points of the plan. By when taking notes, try to express your thoughts in your own words. Records it should be conducted clearly.
5. Write down your quotes correctly. When quoting, keep in mind conciseness and significance of the thought.

It is advisable to include more than just theses in the abstract text provisions, but also their proofs. When making a synopsis, you must: aim for the capacity of each offer. Thoughts of the author of the book follow state briefly, taking care of the style and expressiveness of what is written. Number additional elements of the synopsis should be logical in order to be reasonable, records should be distributed in a certain area. a sequence that corresponds to the logical structure of the work. you need to leave the fields for updates and additions.

Mastering the skills of taking notes requires the student to: purposefulness, daily independent work.

Practical exercises.

To ensure that practical exercises bring maximum benefit
However, it should be remembered that the exercise and problem solving are conducted according to the following rules: read the material in the lectures and are usually associated with a detailed analysis of individual questions of the lecture course. It should be emphasized that only after mastering the lecture material from a certain point of view (namely, with the one with which it is presented in lectures) it will be fixed

in practical classes as a result of discussion and analysis lecture material, as well as by solving problem situations, tasks. Under these conditions, the student will not only learn the material well, but also they will learn how to apply it in practice, and will also receive additional training. an incentive (and this is very important) for active study of the lecture.

When solving problems on your own, you need to justify each stage solutions based on the theoretical provisions of the course. If the student sees if there are several ways to solve the problem(problem), then you need to compare them and choose the most rational one. It is useful to make a list before starting calculations a short plan for solving the problem (s). Solving problematic issues or examples should be described in detail, calculations should be placed in strict order. separate auxiliary calculations from the main ones. Solutions for if necessary, please provide comments, diagrams, drawings, etc. drawings.

It should be remembered that the solution of each training task should be: be brought to the final logical answer required by the condition, and if possible with the output. The received response should be checked in ways that follow from the nature of this task. It is also useful (if it is possible) to solve it in several ways and compare the results obtained results. You need to continue solving this type of problem until you purchase it solid skills in solving them.

Self-check.

After studying a certain topic from the notes in the summary, and the textbook, as well as solving a sufficient number of relevant tasks in practical classes and independently, the student is recommended to: using the reference signal sheet, reproduce the definitions from memory, conclusions of formulas, statements of main propositions and proofs.

If necessary, you need to carefully understand the the material.

Sometimes the lack of assimilation of a particular question becomes clear only when studying further material. In this case, go back go back and repeat the poorly learned material. Important learning criteria theoretical material - ability to solve problems or pass tests based on the completed material. However, it should be remembered that the correct the solution to the problem can be obtained by applying the following methods: memorized formulas without understanding the essence of theoretical propositions.

Consultations

If in the process of independent work on the study when studying theoretical material or solving problems, the student has the following problems: questions that can't be resolved on your own, you must: contact your teacher to get a certificate from them explanations or instructions. In their questions, the student should clearly express what they are experiencing. difficulties, the nature of this difficulty. The consultation should be followed by please also contact us if you have any doubts about the correct answers to the following questions: self-test questions.

Preparation for exams and credits.

Study of many general professional and special disciplines ends with an exam. Preparation for the exam helps to consolidate, deepening and generalizing the knowledge gained in the learning process, as well as applying them to solving practical problems. Preparing for the exam, a student eliminates existing knowledge gaps, deepens, systematizes and improves the quality of knowledge. organizes your knowledge. In the exam, the student demonstrates that he / she acquired in the course of training in a specific academic discipline.

An exam session is a series of exams that are set by the following criteria: the curriculum. The interval between exams is 3-4 days. You should not think, that 3-4 days is enough for successful preparation for exams.

In these 3-4 days, you need to systematize your existing knowledge. consultations before the exam, students will be introduced to the main features of

they will answer any questions they may have. Therefore, the visit is consultations are required.

Requirements for the organization of preparation for exams are the same as in the previous case. during the semester, but they should be observed more strictly. first, it is very important to follow the daily routine; sleep at least 8 hours a day, classes end no later than 2-3 hours before bedtime. Optimal class hours, especially in math, are in the morning and afternoon. walking in the fresh air is recommended in between classes, relentless sports activities. Second, the availability of good own lecture notes. Even in that case, if any information was omitted a lecture, you need to restore it during (rewrite it at the department), think about it, remove any questions that arise in order to memorize the material it was deliberate. Third, when preparing for exams, the student should have be a good textbook or synopsis of literature read as directed teacher during the semester. Here you can effectively use reference signal sheets.

First, you should review all the material on the discipline you are taking, note difficult questions for yourself. Be sure to understand them. conclusion once again it is advisable to repeat the main provisions, using the reference signal sheets.

Systematic preparation for classes during the semester will allow you to: use the time of the exam session to organize your knowledge.

Rules for preparing for tests and exams:

- It is better to immediately orient yourself in all the material and be sure to arrange all the material according to the exam questions (or questions discussed in seminars), this work can take a long time time, but everything else is already technical details (the main thing is orientation in the material!).

* The preparation itself is not just about "memorizing". Preparation it also involves rethinking the material, and even considering alternative ideas.