

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL UNIVERSITY "CHERNIHIV POLYTECHNIC"

APPROVED BY
Academic council of Chernihiv
Polytechnic National University
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No. 26 as of 31 August 2020 p.

Methodical recommendations on performance and registration of qualification
works of applicants of higher education of educational degrees "bachelor" and
"master"

Chernihiv Polytechnic National University

(as amended in accordance with the decision of the Academic Council of 28.12.2020,

Minutes №10, and the order of the rector № 120 from 28.12.2020)

1 GENERAL PROVISIONS

1.1. Methodical recommendations of implementation and design qualification works of applicants for higher education degrees "bachelor" and "master" (hereinafter - Recommendations) of the National University "Chernihiv Polytechnic" (hereinafter - the University) is part of the internal quality assurance system of higher education of the University and designed to establish requirements for writing, design and evaluation of qualification works.

1.2 Qualification work is a final individual written work, which allows you to get a comprehensive idea of the level of theoretical knowledge and practical training, the ability to work independently in the chosen specialty.

1.3. Forms of qualification work include (not limited to specified): final qualifying work (project) bachelor, diploma work, diploma project, etc. and are determined by the graduating department in appropriate guidelines.

1.4 Execution and protection of qualification work is one of the main types attestation of applicants for higher education (hereinafter - HE), the purpose of which is to establish the compliance of learning outcomes of HE with the requirements of the educational program.

1.5 Protection of qualification work by persons obtaining a degree bachelor's or master's degree, is carried out by the examination commission (hereinafter - EC), in accordance with the provisions on the procedure for establishing and organizing the work of examination commissions for certification of higher education students of the National University "Chernihiv Polytechnic".

1.6 Management of qualifying work is carried out by qualified scientific and pedagogical workers (hereinafter - SPW). The organization and control over the process of preparation and defense is entrusted to the head of the graduating department. The subject of qualification works is annually adjusted taking into account the development of the relevant industry, the needs of the region, the experience gained at the departments, the wishes of employers and the recommendations of the EC.

1.7 Responsibility for the correctness of decisions, justifications, calculations and quality of registration of qualifying work is borne by ZVO.

1.8 Qualification work that does not meet the requirements for content and The design, written without following the approved calendar plan, does not contain materials of specific research of the topic, substantiated conclusions and proposals, has plagiarism, and also has no reviews, is not allowed to be defended.

2 PERFORMANCE OF QUALIFICATION WORK

2.1 The main stages of qualification work are: acquaintance of ZVO with

- the basic requirements to performance of qualification work;
- the choice of the topic of work and appointment of the head is carried out on the basis of the

personal statement of ZVO;

- processing of literary sources, study of theoretical and practical materials on the chosen topic;

- development of a plan of qualification work with indication of terms writing sections and their volumes. Filling in the form "Tasks for qualifying work" and its approval at the department;

- collection of materials, compilation of bibliography, analysis and generalization collected material;

- teaching analyzed and systematized material according to the plan;

- conducting an experiment or questionnaire, performing calculations, y including the use of computer processing;

- formulation of conclusions;

- preparation of the graphic part of the work: drawings, figures, tables (if necessary);

- submission of qualifying work to the department for preliminary consideration;

- writing a report and preparing illustrative material (for example, tables and graphs for public speaking);

- review of qualification work and registration of the head's response;

- submission of qualification work to the EC;

- protection of qualification work.

2.2 Feedback is an assessment by the supervisor of the level of preparation of the qualification work

ZVO, which includes justification of the relevance of the topic, the logic and structure of the material, the quality of review and analysis of the literature, the correctness of citations and references to quotations from other authors, the correctness of their own conclusions, compliance with the purpose and objectives, quality of design, testing results .

2.3 A review is an assessment of the qualification work of the provided free economic zone highly qualified specialists of industrial and scientific organizations, employees and NPP of higher educational institutions and contains an assessment of work.

2.4 Professors are appointed as supervisors of qualification work, associate professors, as well as other NPP of the University who have a scientific degree and (or) academic title. Employees of research structural subdivisions, as well as highly qualified specialists of enterprises (organizations) who have a scientific degree may also be admitted to the management of qualification works of the master's degree.

2.5 In due time ZVO reports to the head and the head departments that record the degree of readiness for work.

2.6 The student performs qualification work at the University, and in some cases, with the consent of the head, on the basis of enterprises, research institutes and other organizations.

2.7 Responsibilities of the head of qualification work:

- provide assistance in choosing the topic, its final wording and limits of disclosure;
- recommend special, normative literature and information sources on the chosen topic;
- to advise the Free Economic Zone on the performance of work;

- monitor compliance with the calendar plan, quality and independence performance of work, to inform the head of the department about the course of preparation of work for protection;

- to organize a student for approbation at the meeting of the department; to respond to the qualifying work.

2.8 Responsibilities of ZVO:

- adhere to the schedule and report on time before supervisor on the progress of work;
- write and format the text of the work in accordance with the requirements of these Recommendations;
- not later than two weeks before the day of defense at the meeting of the examination commission to submit a work (project) for preliminary consideration at the department;
- get the necessary reviews and feedback from the head.

2.9 The qualification work is accompanied by a submission to the President of the EC on defense qualification work (see the provisions on the procedure for establishing and organizing the work of examination commissions for attestation of higher education students of the National University "Chernihiv Polytechnic", supervisor's review, review, implementation documents, copies of own publications based on research results (articles, abstracts).

2.10 All qualification works of applicants for higher education of the University educational degree "bachelor" and "master" are subject to plagiarism in accordance with the procedure for testing the qualification of applicants for higher education for plagiarism at the National University "Chernihiv Polytechnic".

3 CONTENT OF QUALIFICATION WORK

3.1 The content of the qualifying work is determined by its topic.

3.2 The title page shall be drawn up in accordance with Annex A.

3.3 Task (Appendix B) is made by ZVO together with the head, signed them and approved by the head of the department.

3.4 In the annotation - 1 page (up to 800 characters) - the surname is indicated and initials ZVO, the name of the qualification work, the main content and results. The presentation of the material in the annotation should be concise and accurate. It is necessary to use syntactic

constructions inherent in the language of business documents, to avoid complex grammatical inflections, to use standardized terminology, to avoid little-known terms and symbols. After the annotation, the keywords are given in the appropriate language.

3.5 Keywords (words of specific terminology on the topic, which are most common occur in the work) are given in the nominative case. Number of keywords - 5-7.

The abstract should be written in Ukrainian and one of the foreign languages (mostly English), placed on a separate sheet with keywords and preceded by content.

3.6 If specific terminology is used in the work and also used little-known abbreviations, new characters, symbols, etc., the list of symbols can be presented as a separate list, which is placed before the table of contents, after the annotation and the list of keywords.

The list should be printed in two columns: in the left alphabetical order there are abbreviations, and in the right - their detailed decoding.

If in the work special terms, abbreviations, symbols, designations are repeated less than three times, the list is not made, their decoding is given in the text at the first mention.

3.7 Table of contents - 1-2 pages - should consist of three blocks (sections): theoretical, analytical and practical.

The material of the work should be presented as a whole in a logical sequence. Contents include: introduction; the names of all sections, subsections, paragraphs and sub-paragraphs are listed sequentially (if they have titles); conclusions and suggestions; References; applications.

Opposite each position are page numbers that indicate the beginning of the material. A sample of the content is given in Annex B.

3.8 The introduction indicates the problem that needs to be solved, its degree research, the relevance and purpose of research in the chosen direction, the tasks to be achieved to achieve the goal, object and subject of research, scientific novelty and practical significance of the work (for free educational and educational programs). Approbation of research results is also noted - speeches at student scientific conferences, publication of research results. The volume of the introduction, as a rule, should not exceed 2,5 - 3 pages.

Actuality of theme presented in the form of critical analysis and ways problem solving, justification of the need for research for enterprises and organizations.

Goal (representation of the result. Determining the goal, the researcher presents himself, what result he intends to get, what will be this result) *and work tasks* should be clearly articulated and reflect the subject matter research.

Object of study is determined together with the choice of topic and is one of the parties activities of the business entity (methodological characteristics of the study; the process or phenomenon that creates the problem situation and selected for study. The definition of the object is associated with the answer to the question: what is being considered?).

Subject of study contained within the problem object, which needs a solution (methodological characteristics of what is within the object of study. The subject indicates the aspect of consideration, gives an idea of how the object is considered, ie the definition of the subject is associated with the answer to the question of how the object is considered research).

*Method** - a set of techniques, operations and methods of theoretical knowledge and practical transformation of reality, achieving certain results.

*Method** - is considered as an instruction for the implementation of the method research.

Scientific novelty * should contain the results of independent analytical and experimental nature.

Practical significance * should contain the results of own research, that can be implemented in the activities of enterprises, institutions.

Approbation of work (for qualification works of applicants for higher education educational degree "master") should contain the titles of articles, abstracts of reports prepared on the basis of work, speeches at scientific and practical conferences and other scientific events.

3.9 The content of the main part of the qualification work is presented in sections.

Sections can be divided into subsections, paragraphs, sub-paragraphs.

Theoretical part work is devoted to theoretical and methodological

aspects of the selected object and subject of research. Theoretical substantiation should determine the role and place of the studied phenomena and processes in ensuring high efficiency of the business entity, contain an analysis of existing experience in the relevant field.

Structurally, it consists of 2-4 sections, contains a theoretical statement of important aspects of the problem, a critical review of information sources, analysis of the subject at the macro level, the use of achievements of domestic and foreign scientists in the development of the subject.

General theoretical approaches to the topic with the use of modern literature sources on the research problem, as well as issues of coverage of the theoretical foundations of the study (critically analyzed monographs, scientific articles, conference proceedings, electronic resources, etc., including foreign authors); it is mandatory to compare different points of view, the use of statistical information (with reference to sources). The analysis of statistical data and / or world experience on the research topic is obligatory in the theoretical section. During the disclosure of theoretical issues should highlight elements of scientific novelty with the formulation of the author's own position on the direction of research, original author's proposals for the development of theoretical and methodological issues. The theoretical section ends with brief conclusions, which are numbered.

The analytical part provides a general description of the subject management, on the example of which is investigated defined in the topic of work problem, analysis of its indicators, current achievements and unresolved problems in the researched aspect of activity. The content of this section is analytical basis for the development of practical recommendations and should be organic combined with the next section.

Based on the available information, the student summarizes the results of analytical research and concludes at the end of the section on the need to address issues. The given analysis of a condition of a problem both in theoretical, and in analytical aspects should contain obligatory references to sources of the information (from the list of the used sources).

The content and structure of this section is determined by the topic and aims to identify areas for improvement of the problem. The section should be as saturated with factual information (tables, graphs, charts, diagrams), reflecting the relevant results of the research base for the last 3-5 years.

The analytical part ends with brief conclusions, which formulate the main results of the analysis. The results of the analysis are the basis for the development of the practical part of the qualification work.

The practical part of the work contains the author's own suggestions on solving problems in the chosen field for research. The author puts forward a certain hypothesis, evaluates its reality and substantiates the economic feasibility.

This part of the work should be aimed at developing and justifying proposals for the subject of research.

It must contain substantiated practical proposals of the student, aimed at achieving the goal set in the introduction. Structurally, the section should contain 2–4 subsections.

3.10 The conclusions and proposals contain the results of the conducted research, main scientific and practical results, recommendations for their scientific and practical use. Conclusions are formed in accordance with the tasks.

Own proposals for solving the problem object of issues appropriate study should correspond to the conclusions.

Conclusions begin as follows: "Based on the results of the study (indicated in accordance with the purpose) the following conclusions are formulated"

Conclusions are numbered.

In the conclusions it is necessary to emphasize the qualitative and quantitative indicators of the obtained results, to substantiate the reliability of the results, to state recommendations for their use.

3.11 The appendices contain supporting materials: copies of documents, extracts from regulations and documents, reports, individual instructions / regulations / rules, results of opinion polls, cumbersome tables, figures, etc.

3.12 References should include sources cited in the text link. The list consists of regulations, regulations, domestic and foreign scientific and special literature, professional publications, electronic resources. Requirements for the list of references are given in DSTU GOST 7.1: 2006 "System of standards for information, library and publishing. Bibliographic record. Bibliographic description. General requirements and rules of compilation "; DSTU 3582: 2013 "Information and documentation. Bibliographic description. Abbreviations of words and phrases in Ukrainian. General requirements and rules (ISO 4: 1984, NEQ; ISO 832: 1994, NEQ) "and DSTU GOST 7.80: 2007" Bibliographic record. Title. General requirements and rules of assembly ".

3.13 The final qualifying work (project) is made out according to requirements of DSTU 3008: 2015 "Reports in the field of science and technology. Structure and design rules".

4 REQUIREMENTS FOR QUALIFICATION WORK

4.1 General requirements

The structure of qualification work consists of:

- title page;
- task;
- annotations and keywords;
- list of symbols (if necessary);
- content;
- entry;
- the main part;
- conclusions and suggestions;
- References;
- applications

The volume of the main text of the qualification work of the bachelor's degree should be 50-60 pages, the master's degree 60-80 pages (excluding appendices). Deviation within $\pm 10\%$ is allowed. Literature review should not exceed 25% of the total work.

Qualification work is performed in the state language.

The text is printed using a computer on one side of a sheet of white A-4 paper at 1.5 line (computer) intervals, font Times New Roman, 14. The text must be printed, leaving the edges at least the following sizes: left - 25 mm, right - 10 mm, top and bottom - 20 mm.

The size of the paragraph indent is 1.25 mm.

The text of the main part is divided into sections and subsections.

Headings of structural parts: "TABLE OF CONTENTS", "INTRODUCTION", "SECTION", "CONCLUSIONS", "LIST OF LINKS", "APPENDICES" are printed in capital letters symmetrically to the text.

Headings of subdivisions are printed in small letters (except for the first capital letter) from paragraph indentation. Do not put a period at the end of the title. If the title consists of two or more sentences, they are separated by a period. The distance between the title and the text should be 1-2 intervals. Each *section* should start on a new page.

4.2. Numbering

The numbering of pages, sections, subsections, figures, tables, formulas is given in Arabic numerals without the sign №.

The first page is the title page, which is included in the general page numbering. On the title page the page number is not affixed, on the following pages the number is affixed in the upper right corner without a dot at the end.

The captions of the sections "TABLE OF CONTENTS", "INTRODUCTION", "CONCLUSIONS", "LIST OF LINKS", "APPENDICES" are given in the text without adding a serial number.

Section headings are numbered and printed on a new line (see Appendix B).

Subsections are numbered within each section. The subdivision number consists of the section number and the serial number of the subdivision, between which a full stop is placed, for example: "2.3." - the third subsection of the second section. Then in the same line is the title of the unit.

Illustrations (diagrams, graphs, charts) and tables must be submitted immediately after the text where they are mentioned for the first time, or on the next page.

Illustrations are marked with the word "Figure" and numbered sequentially within the section, except for those given in the annexes. The illustration number consists of the section number and the sequence number of the illustration, between which a period is placed. For example: "Figure 1.2" - the second figure of the first section. The number of the illustration, its title and explanatory captions are placed consecutively under the illustration in the center. If necessary, explanatory data (pictorial text) are placed under the illustration. The designation "Figure" together with the title of the illustration is placed after the explanatory data. Example of illustration:

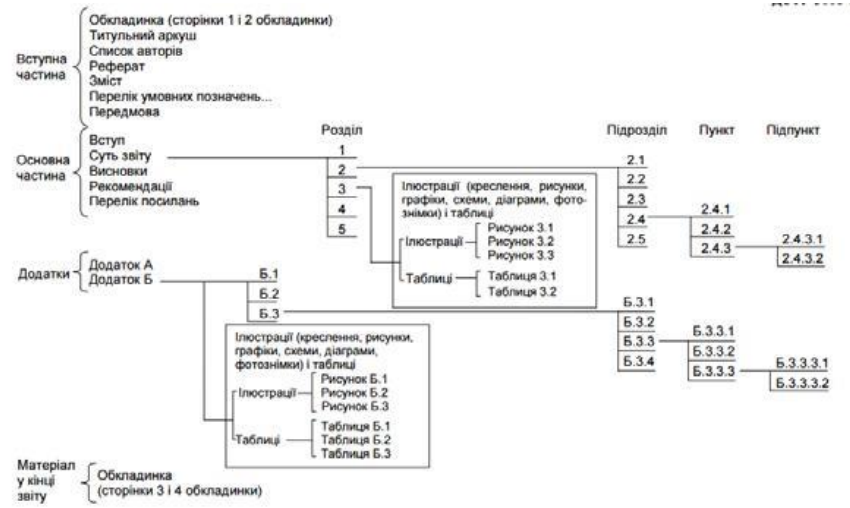


Figure 1 - Block diagram of the report

The tables are also numbered sequentially (except for the tables in the appendices) within the section. In the center before the corresponding title of the table place the inscription "Table" with the indication of its number. The table number consists of the section number and the ordinal number of the table, between which a full stop is placed, for example: "Table 1.2" - the second table of the first section.

When transferring part of the table to another sheet (page), the word "Table" and its number are indicated once to the left above the first part of the table, above the other parts write the words "Continuation of the table" and indicate the number, for example: "Continuation of table 1.2".

Formulas numbered within the section. The formula number consists of section numbers and the ordinal number of the formula in the section, between which a full stop is placed. The numbers of the formulas are written near the right bank in the extreme right position on the line of the sheet at the level of the corresponding formula in parentheses in Arabic numerals, for example: "3.1" - the first formula of the third section.

Only those formulas that are referenced in the text should be numbered. Other numbering is not recommended.

4.3 Tables

Example of table construction:

«Table 1.2 - Dynamics of the level of monetization of Ukraine 's economy and inflation with 1997 to 2010 *

Year	The main indicators		
	Unit M3, billion UAH	Nominal Coefficient GDP, UAH billion monetization,%	Consumer price index, %
1997	12.5	93.7 13.34	110.1
1998	15.7	102.6 15.30	120.0
1999	22.1	130.4 16.95	119.2
2000	32.3	170.1 18.99	125.8
2001	45.8	204.2 22.43	106.1
2002	64.9	225.8 28.74	99.4

* Calculated by the author on the basis of data from the State Statistics Committee Of Ukraine and the National Bank of Ukraine "

The table can have a name that is printed in lower case (except for the first

large) and placed above the table. The title should be concise and reflect the table of contents.

If digital or other data in any row of the table is not given, it is put a dash.

4.4 Formulas

An explanation of the values of the symbols and numerical coefficients should be given directly under the formula and in the sequence in which they are given in the formula. The value of each symbol and numerical coefficient must be given from the new one rare. The first line of the explanation begins with the word "where" without a colon.

Example:

$$v = \omega \cdot Rl \text{ ,,} \quad (4.1)$$

where ω - angular velocity;
 Rl - shaft radius.

Equations and formulas should be separated from the text by separate lines. If the equation does not fit in one line, it should be transferred after the equal sign (=) or after the plus (+), minus (-), multiplication (\times) and division (:).

4.5 Links

In the process of writing the work ZVO should provide references to sources, materials or individual results that he cites in the work, or on what ideas and conclusions the problem is developed.

References in the text should be indicated in square brackets by the ordinal number according to the list of references, for example: "... in works [1–7]...".

When referring to sections, subsections, paragraphs, sub-paragraphs, illustrations, tables, formulas, equations, appendices indicate their numbers. References should be made: "... in section 4 ...", "... see 2.1 ...", "... for 3.3.4 ...", "... in accordance with 2.3.4.1 ...", "... in fig. 1.3 ...", "... in Figure 1.3 ...", "... in Table 3.2 ...", "... (see 3.2) ...", "... by formula (3.1) ...", "... in equations (1.23) - (1.25) ...", "... in Annex B ..."

4.6 Appendices

Appendices are placed in the order of links in the text. Each application must start on a new page and have a title. Above the title symmetrically relative to the text of the page in small letters with the first capital letter is printed the word "Appendix" and a capital letter to indicate the sequence (*Addition AND*).

Appendices should be marked consecutively with capital letters of the Ukrainian alphabet (for example: appendix A, appendix B), except for the letters G, E, C, I, I, J, O, H, b.

4.7 List of links

The list of links is built in the order in which the links appear in the text or in alphabetical order.

Requirements for links:

a) reference to the book:

1. Economic aspects of alternative energy: textbook. way. for applicants for higher education special. "Environmental control and audit" / IF Petrenko. - Chernihiv: Nat. Chernihiv Polytechnic University, 2020. - 152 p.

b) link to the article:

1. Kuznetsova SA The cash flow management paradigm is chaotic structured economy / S.A. Кузнецова, В.М. Думpling // Academic Review. - 2012. - №1. - P. 63-68.

c) links to electronic sources of information:

1. Monetary Review for 2011 // Official site of the National Bank of Ukraine / [Electronic resource]. - Access mode: <http://www.bank.gov.ua>

d) references to regulatory documents:

1. Law of Ukraine "On the Antimonopoly Committee of Ukraine": as of November 26, 1993 / Verkhovna Rada of Ukraine. / [Electronic resource]. - Mode access: <http://zakon.rada.gov.ua/cgi-bin/laws/main.cgi?nreg=3659-12> & p = 1311770615678004.

4.8 Complex qualification works

In the case of real qualification works commissioned by enterprises (organizations) or works aimed at updating, improving the material and technical base of the University, the subject of qualification works can be complex. To perform complex work, a group of free economic zones is involved, each of which researches (develops) a separate direction of a complex topic. The management of complex work is carried out by one head.

In this case, the volume of the settlement and explanatory note, which is drawn up in one copy for the whole team of authors, and (or) the graphic part of such work is set by the graduating department and may differ from the volume defined in paragraph 4.1.

Confirmation of the actual work is a certificate of implementation of the results, which also indicates the entire team of authors.

Title page of the qualification work

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL UNIVERSITY "CHERNIGIV POLYTECHNICS"

Educational and Scientific Institute _____

Faculty _____

Department _____

Admitted to protection

Head of Department

(Full Name)

" ____ " _____ 201__r.

QUALIFICATION WORK

(title of work)

(code and name of the specialty, educational program)

(branch of knowledge)

Performer:

student gr. _____

(Full Name,)

(signature)

Head:

(position)
title)

(scientific degree, academic
title)

(Full Name,)

(signature)

The reverse side of the title page of the qualification work

I, _____, confirm that this work is my own written work, designed in accordance with the values and principles of ethics and academic integrity in accordance with the Code of Academic Integrity of the National University "Chernihiv Polytechnic". I have not used any sources other than the ones cited links in the work.

Date

Signature

Annex A of the Methodological Recommendations has been amended in accordance with the decision of the Academic Council of 28.12.2020, protocol №10, and the order of the Rector № 120 of 28.12.2020)

Individual task for qualification work

MINISTRY OF EDUCATION AND SCIENCE OF UKRAINE
NATIONAL UNIVERSITY "CHERNIGIV POLYTECHNICS"

Educational and Scientific Institute _____

Faculty _____

Department _____

I APPROVE

Head of Department

(Full Name)

" ___ " _____ 201__r.

INDIVIDUAL TASK

FOR THE QUALIFICATION WORK OF THE APPLICANT OF HIGHER EDUCATION

(Full Name)

Work topic: _____

The topic was approved by the order of

the rector from " ___ " _____ 202__r. №

1. *Input to work* _____

2. *Contents of the settlement and explanatory note* _____

3. *List of graphic material (if necessary)*_____

4. Calendar plan

№	Name of stages of work	Deadline	Notes

Tasks prepared by:

head _____

(signature)

_____ (surname,

first name, patronymic and)

«__» _____ 201__ p.

Tasks received:

student _____

(signature)

(Full Name)

«__» _____ 201__ p.

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