Master Thesis

General information and recommendations

Details of the educational component	
Level of higher education	*Second (Master)*
Branch of knowledge	*12 Information Technologies*
Specialty	*121 Software Engineering*
Educational program	*Software Engineering of Multimedia and Information-Retrieval Systems*
Status of the educational component	*Normative*
Form of education	*Full-time*
A year of training	*1-2 years*
The scope of the educational component	*Independent work of student: 480 academic hours*
Semester control / control measures	*Master's thesis defense*
Schedule of defenses	*According to the schedule of the current academic year*
Execution language	*English*
Information about scientific supervisors	*DSc, prof. Viktor Legeza, legeza@pzks.fpm.kpi.ua* *DSc, assoc. prof. Yevgeniya Sulema, sulema@pzks.fpm.kpi.ua* *PhD, assoc. prof. Tetiana Zabolotnia, zabolotnia@pzks.fpm.kpi.ua* *PhD, assoc. prof. Lesya Lyushenko, lyushenko@pzks.fpm.kpi.ua* *PhD, assoc. prof. Oleksandr Neshchadym, neshchadym@pzks.fpm.kpi.ua* *PhD, assoc. prof. Liubov Oleshchenko, oleshchenko@pzks.fpm.kpi.ua* *PhD, assoc. prof. Mykola Onai, onay@pzks.fpm.kpi.ua* *PhD, assoc. prof. Inna Saiapina, saiapina@pzks.fpm.kpi.ua* *PhD, assoc. prof. Vasyl Yurchyshyn, yurchyshyn@pzks.fpm.kpi.ua* *PhD Natalia Rybachok, rybachok@pzks.fpm.kpi.ua* *PhD Olga Sulema, olga.sulema@pzks.fpm.kpi.ua* *PhD Yana Khitsko, khitsko@pzks.fpm.kpi.ua* *PhD Oksana Shkurat, shkurat@pzks.fpm.kpi.ua*

General Information

Work on a master's thesis is a process that continues throughout the entire period of training of a master's student under the ONP (1 year and 9 months). This process begins with the selection of the topic of the master's research and confirmation of the scientific supervisor, and ends with the defense of the master's thesis, which is carried out based on the written application of the student to the head of the graduation department.

*The following are the main recommendations for choosing a **topic for master's research** and formulating a **topic for a master's thesis**.*

1. *The subject matter of the master's research should correspond to the interests of the master's student and the content of the National Academy of Sciences.*

2. *The master's thesis must be devoted to the solution of an actual scientific, scientific-technical or scientific-methodical problem in the field of software engineering, in particular software engineering of multimedia and information-search systems.*

3. *A typical dissertation topic begins with the words "Method (methodology) ...", "Algorithmic-program method ...".*
4. *The topic of the dissertation must be agreed with the prospective supervisor.*

The **result of the master's thesis** should be elements of new knowledge, which are implemented in the form of a method, methodology and software that implements them.

The **scientific novelty** of the master's thesis consists in the creation of new and improved existing methods and techniques in the field of software engineering, in particular software engineering of multimedia and information-search systems.

Schedule of work on the master's thesis	
Performance period	*Work content / Performance result*
The first year of master's training	
1 September – 15 October	1) Selection of the research direction and coordination of the subject of the master's research with the intended scientific supervisor; 2) confirmation of a master's student under a scientific supervisor; 3) formulation of the purpose of the research, tasks from the master's thesis; 4) definition of the object and subject of research.
15 October – 15 December	1) Thorough familiarization with the subject branch; 2) definition of the structure of the master's thesis.
15 December – 15 February	1) Literature study, search for additional literary sources, patent search; 2) determination of the schedule of work on the first section; 3) conducting scientific research.
15 February – 15 June	1) Work on the first section of master's thesis; 2) conducting scientific research; 3) determination of the schedule of work on the second section.
The second year of master's training	
1 September – 15 October	1) Conducting scientific research, including software development; 2) work on the second section of master's thesis; 3) preparation of a publication (the abstract of a report) at the conference "Applied Mathematics and Computing"; 4) determination of the schedule of work on the third section.
15 October – 15 December	1) Conducting scientific research, including software development; 2) work on an article based on the results of scientific research; 3) work on the third section; 4) final wording of the master's thesis topic for inclusion in the order.
15 December – 15 February	1) Conducting scientific research, including software development; 2) work on the third section; 3) determination of the schedule of work on the fourth section.
15 February – 15 April	1) Completion of work on the text part of the master's thesis.
15 April – 1 May	1) Issuance of the master's thesis.
1 May – 10 May	1) Preparational defence of the master's thesis.
10 May – 31 May	1) Defence of the master's thesis.

Requirements for writing a master's thesis

The text part of the master's thesis is drawn up in compliance with the following general rules:

- *the language is English;*
- *sheet format – A4;*
- *font – Times New Roman, 14 points;*
- *line spacing – 1.5 lines;*
- *page parameters: left margin – 3 cm, remaining margins – 2 cm;*
- *page numbering (except the title page) - in the lower right corner.*

Font requirements for formula elements:

- *an ordinary symbol – Times New Roman, 14 points;*
- *a large symbol (for example, a sum sign) – Symbol or Times New Roman, 16 points;*
- *an ordinary index – Times New Roman, 11 points;*
- *a small index – Times New Roman, 9 points.*

All formulas are numbered, the number is indicated in parentheses to the right of the formula. The reference to the formula in the text is made by its number indicated in parentheses. For example, "Consider equation (5)."

Tables must have a number that follows the word "Table" and a title. The reference to the table in the text is made by its number located after the abbreviation "table." For example, "The characteristics of the HRS system are given in the table. 8". If the table cannot be placed on one page, then it is divided into parts, each of which is placed on a separate page and begins with a header line with column names or numbers (if the columns are numbered, then the first part of the table should contain the second row with column numbers). The second part of the table (at the beginning of a new page) is preceded by the entry "Continuation of the table." and continuing table number. Large tables are placed in the appendices.

The drawing must have a sub-drawing inscription, which contains the serial number of the drawing located after the abbreviation "Figure" and the name of the drawing. The inscription is located below the picture and aligned in the center. The reference to the figure in the text is made by its number located after the abbreviation "fig.". For example, "The resulting binary tree T is shown in Fig. 4". Large drawings are placed in the appendices.

Recommendations for preparation to the Master Thesis defence

The following structure of the report is recommended:

- *relevance of the topic;*
- *the formulation of the problem;*
- *the method / method of solving the task, developed by the master's student;*
- *algorithmic and software developed by a master's student;*
- *scientific novelty of the work;*
- *practical value of the obtained results;*
- *scientific article (bibliographic description of the publication);*
- *approval (at which conferences the research results were presented).*

The presentation should logically complement and illustrate, but not repeat the text of the report. Phrases from the report should not be placed on the slides. Text information on the presentation slides should be concise.

The first slide of the presentation must contain the title of the master's thesis (according to the order), the surname and first name of the graduate, the surname, initials, scientific degree, academic title of the scientific supervisor.

On the second slide, a clearly and succinctly formulated statement of the problem, the goal, the object and

the subject of the research are placed.

The following 1-2 slides provide concise information about the results of the analysis of existing solutions to the given task and the conclusions drawn on the basis of this analysis.

Next, the results of the work carried out are placed on the slides: theoretical exposition, developed schemes, structures, algorithms.

On the penultimate slides, you should provide comparative tables, graphs, charts that prove the reliability of the obtained results and demonstrate their practical value.

At the end of the presentation, clearly and succinctly formulated conclusions and scientific novelty are presented.

The duration of the performance is about 15 minutes. Presentation and report should be well coordinated in time. When preparing for a speech, be sure to speak your speech aloud at least once while running the presentation and check the timing of your speech.

A set of documentation for the Master Thesis defence

The master's student submits the following documents to the Examination Board:

1) *Master's Thesis (book);*

2) *CD with Master's Thesis materials;*

3) *the review result;*

4) *the supervisors's feedback;*

5) *the student's record book;*

6) *copy of published papers;*

7) *implementation confirmation – if available.*

The student should save the files with the Master's Thesis materials to the CD structured in this way:

1) TEXT folder contains a file with the text of the Master's Thesis;

2) PROGRAM folder contains files of the developed software;

3) PRESENTATION folder contains a presentation file.

The names of the files must start with the last name of the student, written in Latin letters. For example, ivanenko_text.docx (the file with the text of Ivanenko's thesis). On the label of the CD, the student writes own surname, first name, patronymic and group.

Educational materials and resources

1. Scientific Work under Master Thesis Subject. Google Classroom. 2022. [Access is given to the registered students]

The recommendations prepared by DSc, assoc. prof. Yevgeniya Sulema.

Approved by the PZKS department (protocol No. 13 dated 22.06.2022).