

VILNIUS UNIVERSITY  
LIFE SCIENCES CENTRE

METHODOLOGICAL REQUIREMENTS FOR THE PREPARATION, DEFENCE AND  
STORAGE OF FINAL THESES

FOR THE STUDENTS OF  
**ENVIRONMENTAL SCIENCE, BIOPHYSICS, BIOLOGY, BIOTECHNOLOGY,  
MICROBIOLOGY AND MOLECULAR BIOLOGY STUDY PROGRAMMES**

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## **GENERAL PROVISIONS**

The document entitled „Methodological requirements for the preparation, defence and storage of final theses for the students of Environmental science and conservation, Biophysics, Biology, Biotechnology, Microbiology and Molecular biology study programmes“ defines the methodological requirements (hereinafter – Methodological requirements) for the final thesis of the first and second cycle students at Vilnius University Life Sciences Centre (hereinafter – LSC). The methodological requirements apply for the students of the following study programmes: Environmental science (Environmental science and Management study programmes), Biophysics (Neurobiophysics, Biophysics study programmes), Biology (Biology, Biodiversity, Neurobiology study programmes), Biotechnology (Bachelor and Master level study programmes of Molecular biotechnology), Microbiology (Bachelor and Master level study programmes of Microbiology) and Molecular biology (Bachelor and Master level study programmes of Molecular biology). Methodological requirements are prepared on the basis of “Regulations for the Preparation, Defence and Storage of Written Academic Papers of Vilnius University Students”, approved by Resolution No. S-2017-12-11 of the VU Senate, and “Description of the Procedure for the Administration of Students’ Written Academic Papers in the Study Information System of Vilnius University”, approved by Order No R-512 of the VU Vice-Rector for Studies.

The Final Thesis – a research paper, independently developed by a student, compliant with the requirements for university studies, witnessing the student’s ability to apply the knowledge acquired during the studies, to find the necessary scientific literature and use it (present, analyse, interpret, etc.), to apply/modify the research methods, to independently cope with the assigned tasks, to provide one’s conclusions (mandatory) and/or recommendations (preferred), and to accurately describe the research in clear, correct and comprehensive language.

The recommended length for the final Bachelor thesis is 30–40 pages without supplements (81000–108000 characters with spaces), and for the final Master thesis – 40–60 pages without supplements (108000–162000 characters with spaces).

The procedure for the preparation, evaluation, defence, grading and storage of the Final Theses is provided in the procedural guidelines for preparation, defence and storage of the final theses (hereinafter – Procedural Guidelines) of the following Vilnius University Life Sciences Centre study programmes, i.e. Environmental Science and Conservation, Biophysics, Biology, Biotechnology, Microbiology and Molecular biology.

## STRUCTURE OF THE FINAL THESIS

An example of the thesis structure is presented in Table 1.

Table 1 Structure of the final thesis

<b>Thesis length</b>	A recommended length of the academic paper: <ul style="list-style-type: none"> <li>• Bachelor thesis: 30–40 pages without supplements (81000–108000 characters with spaces)</li> <li>• Master thesis: 40 – 60 pages without supplements (108000–162000 characters with spaces)</li> </ul>
<b>Thesis language</b>	Lithuanian or English language (if the main language of the student, a supervisor or a consultant is the English language, or the study programme is conducted in English)
<b>Thesis structure</b>	Title page
	Table of content
	Abbreviations (if applicable)
	Introduction
	1. Literature review. Theoretical framework, i.e. a review of scientific literature and its analysis.
	2. Materials and methods
	3. Results and discussion (or 3. Results. 4. Discussion)
	Conclusions
	Recommendations (if applicable)
	Summary in English
	Publications, participation in scientific conferences (if applicable)
	Reference list
	Acknowledgement
	Supplemental materials (if applicable)
An upload onto VUSIS (VU Study Information System), registration and submission for the defence of the final thesis, the procedure of defence, permission to defend, a thesis review, recommendations for the presentation and evaluation are provided in the Procedural Guidelines.	

### Title page and Table of content

The title page should contain university, department, study programme, study year, student's first name and last name, supervisor(s), city and the year. The title page should be designed according to an example in Supplement 1 of Methodological requirements. The author's first name and last name are written in 14pt font; the title is in bold letters, and the rest of the text is written in 12pt font. The title page is included in the numbering, but the page is not numbered, i.e. presumed to be the first. The table of content is designed according to an example in Supplement 2 of Methodological requirements. The main structural parts of the thesis such as table of content, introduction, literature

review, materials and methods, results, discussion, conclusions, references, and supplements must be indicated. The table of content should also contain names and numbers of divisions of the text (i.e. chapters/subchapters), all up to third-level subdivisions. The author of the thesis formulates the name of chapters and subchapters.

### **Abbreviations**

Abbreviations, formulas and names of compounds, programs and alike can be used in the final thesis. Widely used abbreviations (e.g. CNS, PCR, names of amino acids, chemical elements, DNA, RNA, kg, mg etc.) can be excluded from the list of abbreviations.

### **Introduction**

The introduction sets the stage and direction of the work. The length of the introduction should be 1-2 pages. In the introduction, one should outline the essence of the thesis, define the relevance and the novelty of the research, methods, may state the hypotheses etc. Usually, first, it establishes the context of the subject, then narrows down into a more specific review, i.e., starts with what is already known and moves to what requires elucidation. At the end of the introduction, the aim and objectives are presented to the reader.

**The aim of the thesis** is a one-sentence statement, that corresponds to the topic and reflects the object of the thesis. The aim should state the purpose of the research and define the expected outcome. It is written in broad terms and defines the main question of the thesis, while the objectives define subquestions that must be answered to achieve the main goal of the research.

*An example of a research aim: Create mutant variants of an enzyme Y and assess the influence of mutations on the structure and functions of the enzymes.*

**Objectives of the thesis** (3–5) elaborate on the aim, cover all main aspects of the research, and define measurable outcomes. The aim and objectives should be oriented not only to goal achievement but also to the production of results. Avoid generic and broad verbs (i.e. *to know, to describe etc.*) when stating the aim and objectives of the thesis, because the outcome is difficult to define.

It is recommended to use verbs that define the result rather than an action, e.g. *assess, evaluate, validate, compare, prove* etc.

Conclusions at the end of the thesis should correspond to the objectives of the thesis (at least one for each).

*Examples of objectives:*

- 1. *Determine the initial rate of a reaction of an enzyme Y.*
- 2. *Assess the effect of an inhibitor B.*
- 3. *Compare a degree of inhibition in an acidic medium and a basic medium.*

## **The main body of the thesis**

### **Literature review**

Literature review – a systemic overview of research articles and academic papers that are relevant to the research purpose. Theoretical (Literature review) and empirical parts (Results; Results and Discussion) of the thesis should be closely related. The theoretical framework is the base for the empirical part. The length of a literature review should make  $\frac{1}{4}$  or  $\frac{1}{3}$  of the final thesis or 7–15 pages. It is recommended to use the latest (i.e. of the last five years) literature.

The division of the literature review into chapters/subchapters should be clear and reasoned.

### **Description of the study places**

This chapter is mandatory when the data is collected in a natural or any other specific environment. Geographical characteristics of the location should be described providing specific attributes of the environment that are related to the research topic and can affect the results of the study.

### **Materials and methods**

This chapter should include a coherent and clear description of distinct phases of the study, the scope of gathered data, used methods, locations, steps and procedures. Methods should describe the study in a reproducible and replicable manner.

Methods should present:

- Participants of the study (in case it was human research) – who participated in the study, the selection criteria (e.g. age, physical characteristics, rejection criteria etc.).
- Subjects of the study (in case of animals, plants, mushrooms, other living objects or objects of inanimate nature were studied). Describe what species was researched, the selection criteria etc.

*Note:* a permission number to carry out the research must be provided in case an animal study was conducted! The institutional approval is given by the Lithuanian Ethical Committee for Animal testing under the State food and veterinary service. For human research, institutional approval should be granted by the Bioethics committee under the Ministry of Health. If the study aim is only data collection for the final thesis, approval is not required. It is sufficient to inform the Bioethics committee in writing before the start of the study once the protocol is prepared.

Hardware and software for measurements and analysis including statistical analysis, methods, techniques and other important information related to the study must be provided in the methods.

The specific content of methods that is bulky (e.g. questionnaires, specialized stimuli, images, figures etc.) should be presented in an appendix.

Acknowledge other institutions or colleagues if experiments were conducted with their help.

*An example: Analysis of silver nanoparticles was carried out using scanning electron microscopy (SEM) at the Centre for Physical Sciences and Technology under the supervision of dr. A. Anonymous.*

## **Results**

The chapter should reveal the main findings of the study and include their analysis/interpretation/discussion. Results should be illustrated with visual materials (e.g. graphs, tables etc.), and the statistical significance of the results should be indicated (if applicable). A summary of the main findings can be presented in a subdivision of the results chapter.

Results can be presented in one of two the following ways:

- Results and discussion as two separate chapters.
- Results and discussion in one chapter.

The results are presented coherently, concisely and clearly, illustrated with numbers, tables, graphs and alike. Every image and table in the text must have a description, they have to interrelate, i.e. first the image or table is described and only then they are presented.

For example, *a graph of enzyme activity in Fig. 3.2 could be discussed as follows – „Dependency between enzyme activity and the pH of media was examined (Fig. 3.2). The highest enzymatic activity xx (specific value) is noticeable at a pH of 3.4. When media acidification increases, enzymatic activity sharply decreases, at a pH of 2 it is only yy (specific value). As media becomes more alkaline, enzymatic activity decreases less sharply, at a pH of 13 it is zz (specific value) which is 30% of registered maximum“.*

A table or an image should be discussed or analyzed at least in one sentence. Visual materials should not be presented one after the other if there is no relevant comment. Should pictures be presented without comments between them, they are combined as one image and referred to as parts a and b of the image. In case a table span multiple pages (i.e., does not fit on one page or is split into two parts by the page break), for any subsequent page on which the table continues, one should include the table title followed by the word “continued” in parentheses. At the end of a chapter/subchapter, at least one sentence that serves as a summary should be presented.

Information between figures and tables should not overlap, and should not be repeated literally in the text and both figures or tables. When comments about figures and tables are provided, they should emphasize the most significant results.

It is recommended to provide only the main and most significant findings that reflect the essence of the work. Other results can be presented in the appendix or in an additional data carrier (e.g. CD, DVD, USB etc.).

## **Discussion**

This chapter includes a summary, explanation and interpretation of the results in the context of the thesis question and literature review, discusses their implications, acknowledges their limitations, and gives recommendations. It is important to place the findings in the context of previous work, i.e. relate the results with the ones from other studies. In case they don't align or oppose, one should provide a plausible reason or explanation. A comprehensive discussion is a sign of a well written academic paper. If the discussion chapter is subdivided into subchapters, a summary of the whole discussion should be provided at the end of the chapter. Limitations of the study should be discussed along with possible solutions and/or suggestions for future studies.

## **Conclusions**

Conclusions are clear statements to answer the main research question. Conclusions should correspond to the aim and objectives of the thesis, however, they should not reiterate the summary sentences of each chapter. Conclusions should reflect only the main findings. Up to seven short, clear and concise statements without an additional explanation should be provided. Conclusions are not the summary of the main body of the thesis. They should reflect the aim and objectives of the academic paper. Conclusions should reveal the novelty of the work, rather than state the facts provided in the results. It is recommended to support the conclusions with the results of the statistical tests. All conclusions should be numbered.

An example of an inappropriate conclusion: „*A study titled X was conducted*“, „*A literature was reviewed on the X topic*“.

An example of an appropriate conclusion: „*An object movement was examined. It was determined that if an object was still or its speed module and direction were constant, then the restorative force affecting the object equalled zero*“.

## **Recommendations**

Recommendations for the use of the study results or the course of the future studies can be provided. They should be numbered.

## **Reference list**

The reference list should contain all the sources cited in the thesis. Only academic papers that the author has familiarized with and cited are considered appropriate.

The reference list should be in alphabetical order according to the last name of the author. References that have the same author should be chronologically ordered. If the list contains references both in Latin and Cyrillic fonts, references in Latin font should be listed first. If there is a small number of references written in Cyrillic, it is advised to transliterate the title into Latin letters and include it in

the list with the references in Lithuanian, English, German and other languages. When the author of a reference is unidentified (e.g. dictionaries, manuals etc.), it should be listed according to the first letter of the title. An optimum number of references for a Bachelor's thesis is no less than 35, for a Master's thesis – no less than 50. The reference list should be numbered.

Use of citation styles is provided in the chapter „Composition of the reference list“.

### **Summaries**

The length of summaries in Lithuanian and English should be up to 1 page (i.e. up to 4000 characters with spaces) (examples are provided in Supplements 1 and 2). The summaries in both languages should present the title of the thesis and the author, and provide a short, but comprehensive overview of the study pointing out the main conclusions and significance of the work. The summary should portray the relevance of the work, the aim and objectives, methods, the most significant findings, the main conclusions and recommendations. Summaries in Lithuanian and English have to align, i.e. one summary should not contain information that is not provided in the other.

### **Appendices/Supplements**

An appendix should contain valuable supplementary material, such as a list of species, comprehensive data tables and figures, illustrations, that are important but were not included in the main body of the thesis, also, copies of permissions from the Environmental Protection Agency, copies of the author's publication list. Supplements are not a mandatory part of a thesis. In case they are provided, references (e.g. Supplement 1) should be provided in the main body of the thesis. Figures and tables in each supplement are numbered separately.

### **Publishing research results, Financial support, Acknowledgement**

These chapters are not mandatory. However, if the final thesis was part of a project, supported financially by an organization etc., this should be mentioned. An example of potential wording:

*This work was supported by the European Social fund (insert grant number 1) as part of XX and XY project implementation.*

## CORRECTNESS OF LANGUAGE AND FORMATTING OF THE FINAL THESIS

### Language

The thesis should be written in correct Lithuanian or English languages (the thesis is written in English when the student, the supervisor or a consultant are nonnative, or the study programme is in English). The language must be correct, clear, and coherent, it reflects the student's ability to use scientific language, and produce a coherent narrative. Grammar, punctuation and spelling must be examined for errors.

One should follow writing rules and requirements for bibliographic citations in academic papers.

### Formatting and printing

The thesis should be printed and bound before submitting it for the final evaluation by the supervisor, a reviewer and/or the defence committee. An electronic version of the thesis should be made available in PDF. In case the thesis is defended remotely, only a PDF is provided. The thesis should be written in the correct English language. If necessary, Lithuanian terms can be paraphrased in a foreign language in parathesis.

One must follow Lithuanian computer literacy rules, *for example, double quotation marks (,, ... “) instead of single, correct use of hyphens and dashes, (e.g. 1918-02-16, co-operation, 1918–1939 m., –24°C).*

Important to remember:

- Decimal separator depends on the thesis language, i.e. comma is used in Lithuanian, full-stop in English.
- A nonbreaking space is used to separate the unit from the number, for example, 2,68 kg, –4 °C. Nonbreaking space looks like a regular space in a printed document, however, it prevents the number and unit separation in case of a line break.
- The numerical value always precedes the unit.
- Abbreviations of measurement units are always written in the standard font not *italic* no matter the font in the rest of the text.
- Quantity symbols and their indexes should be written in *italic* no matter the font in the rest of the text, for example,  $I_l$ . The exception applies if several quantities have the same letter: physical quantities are written in *italic*, others in the standard font.
- A multiplication symbol is a dot above the line ( $\cdot$ ) or a four-fold rotationally symmetric saltire ( $\times$ ), but not a lower case x in a Latin alphabet.
- Numbers are rounded up to adequate precision.
- Other writing mistakes and their corrections are provided in Table 1.
- A sentence should not start with a digit or a number.

**Table 1** Mistakes and their corrections

Correct	Incorrect
42 cm × 38 cm	42 × 38 cm
150 g ± 3 g; (150 ± 3) g	150 ± 3 g
From 1 MHz to 10 MHz	1 MHz – 10 MHz; from 1to 10 MHz
3°6'8" angle	3 ° 6 ' 8 " angle
$x_p = 0,25$ %	$x_p = 0,25\%$ ; 0,25 percentages; 0,25 proc.
m = 5 kg	m = five kg
Laser length – 5 m	Laser length – five m

Main parts of the thesis: the content table, an introduction, the main body (literature review, materials and methods, results, discussion), summaries in Lithuanian and English, the reference list, and supplements – each should start on a new page. The printed version of the thesis should be of high quality. Text is printed on one side of a white, even A4 format (210 x 297 mm) paper. The font should be *Times New Roman* set at 12 pt, 1.5 intervals between the lines. Margins should be set as follows: top and bottom at 2 cm, left at 2.5 cm, right at 1.5 cm (or left at 3 cm, right at 1 cm). The writing font on the title page should be *Times New Roman* (14 pt) for the author's last name and the title, the latter is written in bold. Footnotes are formatted as follows: *Times New Roman* (10 pt) font, single-line spacing, left and right indent, spaces before and after symbols are in standard size (10 pt). The text of the main body should be aligned on both sides (except on the title page). Indent each line of a new paragraph by 1 cm. Individual words of the text can be highlighted (e.g. in bold, underlined), however, it's not advised to use many different formats.

The academic paper should be written in the third person, without the pronouns „I“, and „We“.

*Incorrect: „For the experiment, I immobilized the enzymes in 3 % calcium alginate gel. I chose the concentration according to the findings from earlier experiments“.*

*Correct: „For this experiment, the enzymes were immobilized using concentrations from earlier experiments“.*

### Numbering

Pages should be numbered consecutively, starting with the title page (note: page number is not displayed) and finishing with supplements. Page numbers in Arabic numerals are inserted at the bottom right corner without full stops or dashes.

Only chapters and subchapters of the main body are numbered, for example:

- a) 1. Literature review, 2. Description of the field study sites, 3. Materials and methods, 4. Results, 5. Discussion;
- b) 1. Literature review, 2. Materials and methods, 3. Results and discussion;
- c) 1. Literature review, 2. Materials and methods, 3. Results, 4. Discussion;

The name of each chapter should either be in capital letters or highlighted, subchapters should be separated by one interval space. No distinctive sign is used at the end of each chapter or subchapter. Page numbering remains consecutive even with supplements. Each supplement should be presented on a separate page titled „Supplements“, they also should be numbered (e.g., Supplement 1, Supplement 2 etc.) (numbers are inserted on the top right) and have titles.

### **Use of specific terms**

Any specific terms used in the thesis should be commented on. In case a term does not have an equivalent in the Lithuanian language or in published scientific papers, the original term should be provided in parenthesis.

### **Useful references**

#### Dictionary

<http://www.vlkk.lt/nuorodos/zodynai>

The term bank of the Republic of Lithuania

<http://terminai.vlkk.lt/>

Consultancy Bank of The State Commission of the Lithuanian Language

<http://www.vlkk.lt/konsultacijos>

#### Orthography

<http://www.vlkk.lt/aktualiausias-temos/rasyba>

<https://www.oxfordlearnersdictionaries.com/>

### **Tables and figures**

Table and figures should be numbered in Arabic numerals and have titles (no punctuation at the end of the title). The numbering of tables and figures is separate and consecutive (e.g. Table 1, Fig. 1). They should be inserted as close to the reference text (i.e., under the paragraph). The numbering of tables and figures should be related to the numbering of the chapters (i.e., Literature review (Chapter 1) – Table 1.1, Table 1.2 etc.; Materials and Methods (Chapter 2) – Table 2.1, Table 2.2 etc.).

Tables and figures must have an author and a reference in case they are taken from another academic paper or source.

Information in figures and tables must be legible.

The number and caption of a table are written above it (a reference is provided above or below the table), a figure number and caption – only below, centred (a reference is provided under the caption).

The caption of the table is written in lower case, left-aligned. Even if one table is provided in the text it should be numbered. Each column should be formatted in such a manner that numbers in every row align. Not recommended captions for columns or rows – “Serial number” or “Units of measurement”.

Units of measurement are provided in the caption of the table in paratheses. A single-line spacing should be used in tables, the caption of tables and comments under tables.

An example of a Table:

Table 1 Changes in glycogen accumulation in *Toxacara canis* tissue under the influence of nitroscanate

<i>T. canis</i> tissues	After feeding nitroscanate				
	4 h	11 h	27 h	48 h	51 h
Muscles	positive PAS reaction	positive PAS reaction	scarce, individual glycogen flakes	negative PAS reaction	negative PAS reaction
Intestinal epithelium	negative PAS reaction in the apical pole	weak positive PAS reaction in the central ara of the cell cytoplasm	glycogen traces above the nuclei	negative PAS reaction	negative PAS reaction

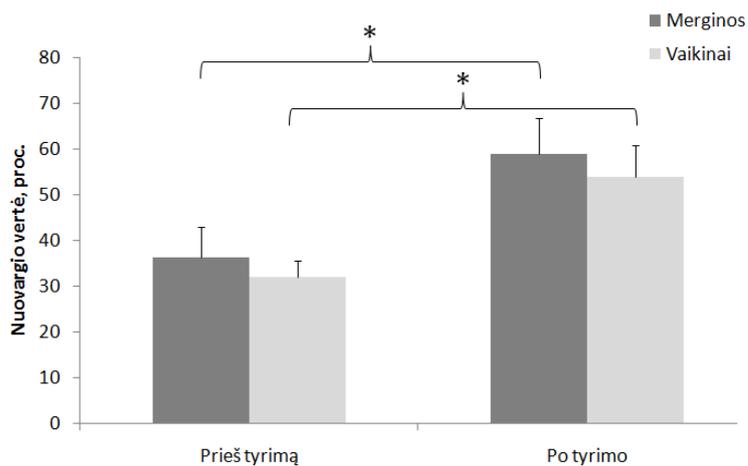
All illustrations (diagrams, graphs, schemes, images and other visual material) are named as figures (e.g. Fig. 1.1, Fig. 1.2 etc.). Microscopic images must contain a scale bar. Recommended font in figures is Arial (e.g. for labelling of axes, curves etc.), it shouldn't be smaller than 8 pt after the final formatting.

If the author of the thesis makes a table or a figure based on another scientific source and provides it in the literature review, references in parenthesis must be provided (e.g. adapted from/based on Johnson, 2009; Smith, 2014; Stevens, 2015).

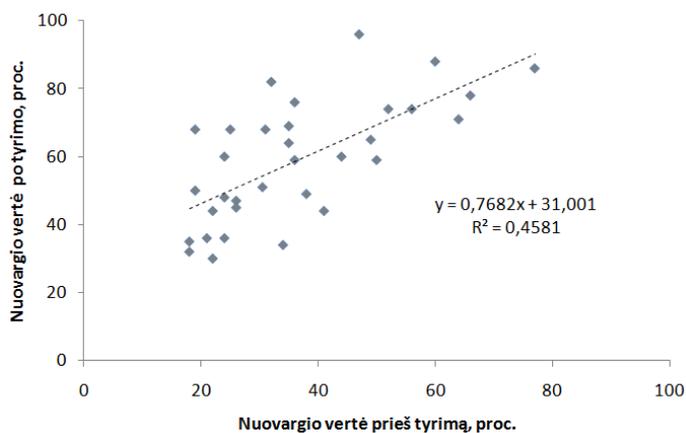
Lines in tables should be single-spaced. Font size in tables and figures should be set at 11 pt, in more complex figures set at 9–10 pt. Visual material should be compact and take up no more than one page each. Large tables or figures should be provided as supplementary material, they must have references in the main body of the thesis (e.g. see Supplement 1).

The use of figures should be well thought out and reasoned. Captions and descriptions of tables and figures must be comprehensive even taken out of the context (i.e., contain used abbreviations, markings etc.).

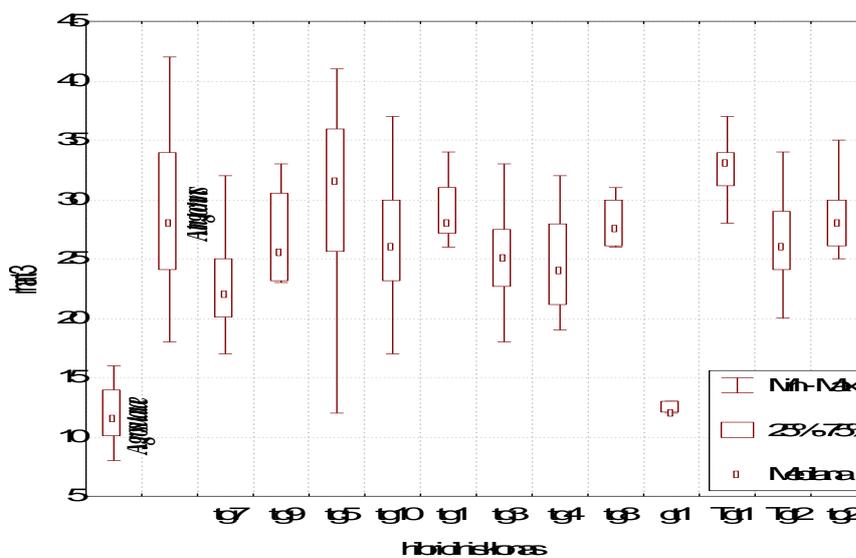
Examples of figures:



1 pav. Subjektyviai vertinto nuovargio priklausomybė nuo lyties ir vertinimo laiko.  
\* -  $p < 0,05$ . Vertikalūs brūkšneliai vaizduoja standartinį nuokrypį.



2 pav. Priklausomybė tarp atskirų tiriamųjų subjektyviai vertintų nuovargio verčių prieš (x ašis) ir po (y ašis) tyrimo. Punktyrinė linija vaizduoja tiesinės regresijos kreivę.



3 pav. Antrinių rinarijų kiekis (rhant3) *Aphis grossulariae*, *A. triglochinis* ir hibridinių klonų sparnuotų partenogenetinių patelių antenų trečiajame narelyje

The visual material in the text (tables and figures) should only be discussed or commented on without duplicating provided information. A chapter or a sub-chapter should not start with a table or a figure.

### **References and citations in the main body**

Statements and classifications of other authors should be paraphrased (not used verbatim), also tables, figures, data, formulas, and statistical data should have original references that allow identification of the source. In case of statements, classifications, definitions, formulas, tables and figures are provided without references, the author of the thesis is considered to be the author of the aforementioned intellectual property.

References can be incorporated in a sentence, for example, „According to Johnson and Stewens (2014), this concept is...“, or provided in parentheses at the end of a sentence or classification, for example, (Smith, 2015). Should there be several scientific sources for the same summarized statement, the references should be provided in parentheses at the end of a sentence, and separated with a semicolon, for example (Johnson *et al.*, 2014; Smith, 2015). In such cases, references should be provided in chronological order starting from the earliest one.

If a work has two authors, their names should be separated with an ampersand (&) in a parenthetical citation, for example, (Johnson & Smith, 2019) or “and” in a narrative citation (an example above). If there are three or more authors, only the last name of the author followed by “et al.” (meaning “and others”) should be included (e.g. Smith et al., 2012).

The final reference list is made by the author or an editor (if there are many authors). All references are included in the list without dividing them according to a type (e.g. book, article etc.). References are provided in alphabetical order of the author’s last name and then by date if necessary. The author’s initials go after the last name. If an author published several pieces of work in the same year, they should be referenced by adding lower case letters in alphabetical order, for example, 2021a, 2021b etc. To reference legislation, the type of legislation (e.g. a directive, a law, an order, a conversion, ruling, regulation etc.) should be provided in the reference list. A narrative citation of legislation is the same as for other types of work.

If an author of a work or internet source is not provided, then the first three words of the title and the year (if provided) should be included in a narrative citation, for example (5 reasons for..., 2015) (Source: „5 reasons for success and failure of SMEs in export markets [seen 29-01-2015], link <http://therightsocialmedia.novertur.com/international-trade-2/5-reasons-success-export-markets/>).

Internet sources must redirect to the referenced work, not the main internet page.

Citations should be used in moderation, they should be related to the topic, provided with reference to another authority or for the sake of discussion with expressed opinion in the citation. It

is advised not to overdo rephrasing. Only published or otherwise publicly announced work should be cited. Citations should not be lengthy, no changes should be made to the original text.

Direct quotation is written in italics using quotation marks with the reference to the source and the page number. In case a few words are excluded from the original quotation, the omitted material is marked with an ellipsis <...>. For example, „According to Janonis., „*if the same document is quoted several times, <...> the page number of the quotation must be provided*“ (Janonis, 2005, p. 47).

It is strongly recommended to use primary (original) sources for the thesis. In case of an indirect citation, i.e. an original author is cited from a secondary source, the secondary source should be provided, for example, „Gordon (2015) indicates (as cited in Chomsky, 2006), that „...“. In this case, only the secondary source is included in the reference list.

### **Composition of the reference list**

All ideas of other authors that are mentioned, analyzed, or quoted must have references.

Only scientific literature and sources that the author read, analyzed and referred to in the text should be included in the reference list. Lecture notes or unpublished (i.e. not accepted for publishing) work should not be included in the reference list. Unpublished reports can be included in the Environmental Science theses. It is strongly advised against citations of textbooks, usage of news websites (e.g. *Delfi etc.*), and Wikipedia unless the sources from Wikipedia were found and analyzed. Internet sources must redirect to the referenced work, not the main internet page.

The narrative citation should contain the author's last name and the year when the work was published rather than the reference number from the list. Citations from books must contain a page number.

*For example*, „It is suggested that it's impossible or unreasonable to initiate research without an idea of what to look for (Wolcott, 1982, p. 157)“. Double quotation marks (” ”) are required around a direct quote: Wolcott (1982, p. 157) suggested, that „it is impossible to initiate research without an idea of what to look for, and it is also unreasonable if the research question is not formulated clearly“.

The majority of biomedical journals use Harvard referencing, however, it is not mandatory in the thesis. It is more important to follow the same style throughout the paper.

It is recommended to use Harvard referencing. Examples of formatting references:

#### **Books:**

Dighton J., White J.F., Oudemans P. (Eds.), 2005. *The fungal community: its organization and role in the ecosystem*, 3rd ed. Boca Raton: Taylor & Francis.

#### **Part of a book, an article in a book:**

Atkinson C.T., 2008. *Haemoproteus*. In: Atkinson C.T., Thomas N.J., Hunter B.C. (Eds.), *Parasitic diseases of wild birds*: 13–35. Oxford: Wiley-Blackwell Publishing.

#### **Published articles in scientific journals:**

Pakalniškis S., Rimšaitė J., Sprangauskaitė-Bernotienė R., Butautaitė R., Podėnas S., 2000. Checklist of Lithuanian Diptera. *Acta Zoologica Lituanica*, 10 (1): 3–58.

Klauda J. B., Venable R. M., Freites J. A., O'Connor J. W., Tobias D. J., Mondragon-Ramirez C., Vorobyov I., MacKerell A. D., Pastor R. W., 2010. Update of the CHARMM all-atom additive force field for lipids: validation on six lipid types. *The Journal of Physical Chemistry B*, 114 (23), 7830–7843.

**Accepted articles in scientific journals:**

Kulig P., Zabel B.A., Dubin G., Allen S.J., Ohyama T., Potempa J., (in press). *Staphylococcus aureus*-derived staphopain B. *Journal of Immunology*. DOI 10.1007/s10530-008-9248-8.

**Electronic publications (articles, books):**

Jukonienė I., Rasimavičius M., Ričkienė A., Subkaitė M., 2018. S.B. Gorski's bryological collection in the Herbarium of Vilnius University. *Acta Soc Bot Pol.*, 87 (3): 3588. <https://doi.org/10.5586/asbp.3588>

**Websites:**

Cancer-Pain.org [website]. New York: Association of Cancer Online Resources, Inc.; created 2000-01 [refreshed 2002-05-16; cited 2005-05-12]. Link: <http://www.cancer-pain.org/>

**Databases:**

Who's Certified [database]. Evanston (JAV): The American Board of Medical Specialists. Sukurta 2000-01 [cited 2005-05-12]. Link: <http://www.abms.org/newsearch.asp>

**PhD and other theses, reports:**

**Conference papers:**

Malarz K., Defratyka A., Kubis B., Banach M., 2007. Reference style guide. In: Hanus-Lorenz B. (Ed.), *Proceedings of ME Conference (11-13 July, Warszawa, Poland)*: 133–139. Warsaw: Versita.

**Articles in newspapers:**

Sherwin A., 2007. The post-genomic era. *The Times*, 13 July: 1–2.

**Legal acts of the Republic of Lithuania:**

Citation from an electronic source:

Citation from a printed document:

**International agreements and other documents:**

Convention, 1950-11-04. *Convention for the Protection of Human Rights and Fundamental Freedoms* (adopted 4 November 1950, entered into force 3 September 1953). ETS 5; 213 UNTS 221 (ECHR).

## Footnotes

Facts, notes, comments, abbreviations or other additional information that is not be discussed in the main body in more detail can be included in footnotes. Differing from the main body fonts and sizes should be used for footnotes, they should be linked to the text using a reference digit. *For example:*

*One of such discoveries is Petalia<sup>8</sup>.*

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<sup>8</sup> *Asymmetrical protrusion part of the cerebral hemisphere towards the other hemisphere found in the healthy brain.*

**Supplement 1 Title page of the final thesis (an example)**

**VILNIUS UNIVERSITY  
LIFE SCIENCES CENTRE**

---

(FIRST NAME AND LAST NAME OF THE STUDENT (IN CAPITAL LETTERS))

(XXX study programme)

**Bachelor/Master Thesis**

---

(TITLE OF THE THESIS (IN CAPITAL LETTERS))

(The title is set to 14 pt font, highlighted in bold, the rest of the text set at 12 pt )

Supervisor \_\_\_\_\_  
(scientific/ academic degree, first name, last name)

\_\_\_\_\_  
(signature)

Student \_\_\_\_\_  
(signature)

Consultant (if applicable)  
(academic degree, first name, last name)

\_\_\_\_\_  
(signature)

Vilnius, 20XX

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### Supplement 3 Summary of the final thesis (an example)

VILNIAUS UNIVERSITETAS  
GYVYBĖS MOKSLŲ CENTRAS

Vardenis Pavardenis  
Bakalauro/Magistro baigiamasis darbas

## LIETUVOJE PERINČIŲ ANČIŲ RŪŠIŲ MIGRACINIŲ KELIŲ IR JŲ POKYČIŲ ANALIZĖ

### SANTRAUKA

Iš vandens paukščių gausiausiai Lietuvoje paplitę yra Antinių (Anatidae) šeimos paukščiai. Dėl kintančių aplinkos sąlygų ir didėjančio antropogeninio poveikio, kinta daugelio ančių rūšių migraciniai keliai, formuojasi iš dalies migruojančios ar sėslios ančių populiacijos.

Šio bakalauro darbo tikslas – įvertinti Lietuvoje perinčių ančių rūšių migracinių kelių pokyčius Vakarų Palearktikoje. Darbo uždaviniai: nustatyti Lietuvoje perinčių ančių rūšių migracinius kelius Vakarų Palearktikoje, naudojant žiedavimo duomenų analizę; palyginti duomenis su literatūros šaltinių duomenimis; atlikti didžiosios anties, kaip modelinės rūšies, genetinius tyrimus ir nustatyti Lietuvoje, Ukrainoje ir Islandijoje perinčių ir žiemojančių populiacijų genetinės struktūros ypatumus.

Ančių migraciniai keliai buvo tirti analizuojant literatūros šaltinius ir Lietuvos paukščių žiedavimo centro duomenis. Didžiosios anties genetiniai tyrimai buvo atlikti išskiriant haplotipus pagal mitochondrinės DNR D-kilpos regiono sekas. Tyrimai atlikti Ventės rago paukščių žiedavimo stotyje ir Gamtos tyrimų centro Molekulinės ekologijos laboratorijoje 2014 metais.

Parengta Lietuvoje perinčių 14-os ančių rūšių skaitlingumo, pasiskirstymo, migracinių kelių ir jų pokyčių Vakarų Palearktikoje apžvalga, sudaryti gausiausiai Lietuvoje perinčių ančių rūšių radimviečių žemėlapiai Vakarų Palearktikoje bei nustatyti šių rūšių svarbiausi migraciniai keliai Europoje. Lietuvoje žiemojančių ir perinčių didžiųjų ančių genetinė struktūra pagal haplotipų pasiskirstymą yra vienoda. Lietuvoje ir pietų Ukrainoje perinčių didžiųjų ančių genetinė struktūra skiriasi, tam turi įtakos skirtingi šių populiacijų migraciniai keliai. Sėslių ir geografiškai izoliuotų Islandijoje perinčių didžiųjų ančių genetinė struktūra skiriasi nuo kontinentinėje Europoje perinčių šios rūšies populiacijų genetinės struktūros. Nustatyta, kad genetiniai tyrimo metodai, naudojami drauge su tradiciniu paukščių žiedavimu, yra tinkami skirtingų paukščių populiacijų nustatymui bei jų migracijos kelių išsiaiškinimui.

## Supplement 4 Summary of the final thesis in the foreign language (an example)

VILNIUS UNIVERSITY  
LIFE SCIENCES CENTER  
Vardenis Pavardenis  
Bachelor/Master thesis

### **BIODIVERSITY OF GENUS *DICRANOTA* (PEDICIIDAE, DIPTERA) IN LITHUANIA AND DIAGNOSTICAL PROBLEMS OF IMMATURES STAGES**

#### SUMMARY

Crane flies are being researched since XVIII century and their investigations are significant to both ecological and evolutionary issues. Genus *Dicranota* is a large group of 274 aquatic species of crane flies distributed all over the world. 8 species belonging to genus *Dicranota* occur in Lithuania. Larvae of genus *Dicranota* are used for testing the state of water quality as biological indicators. Larvae of only 3 species are described when larvae of the rest of species of this important genus are not known to science.

The main aim of this is to find morphological characters usefull for discrimination of larvae of different species of genus *Dicranota* and assess biodiversity and distribution of this group. Goals of the thesis: to associate larvae of genus *Dicranota* with adults species with reference to molecular methods using mitochondrial DNA cytochrome c oxidase subunit I gene (COI) extracted from larvae and adults of genus *Dicranota*, to distinguish characters of larvae usefull for identification, prepare identification key for all known species of *Dicranota* and to overview diversity and distribution of that genus in Lithuania.

197 speciments of larvae and adults were collected in Southern and Eastern Lithuania in 2016 and examined in the laboratory at the Life Sciences Center (VU). Based on the external morphological features larvae were divided into 6 morphological groups, later morphological characters of head capsule and body segments were examined and mitochondrial DNA COI genus sequencing were done by using universal primers LCO-1490 and HCO-2198 for each of them. The resulting DNA sequences were processed and analized using 'BioEdit' and 'MEGA 7' programmes.

The results showed that mitochondrial DNA COI gene in this group is a reliable method to associate larvae with adults. Larvae of two species – *D. pavida* and *D. gracilipes*, which were previously unknown for science, were described.

**Supplement 5 Recommended review form of the final thesis**

VILNIUS UNIVERSITY  
 LIFE SCIENCES CENTRE  
 XXXX STUDY PROGRAMME

**Review of the final thesis**

**Student's name**.....

**Title of the thesis** .....

.....

**Reviewer** .....

<b>General requirements</b>	<b>Maximum score</b>	<b>Score</b>
1. Does the thesis in its length, scope and content satisfy the requirements for final theses?	2.0	
2. Is the thesis properly written (i.e. proofreading, language, style)?	0.5	
3. Are tables and figures appropriately formatted/designed?	0.5	
4. Do references and citations meet the requirements? Are all cited sources mentioned in the reference list? Is there any publication included in the reference list but not mentioned in the main body?	0.5	
5. Are summaries informative enough? Is the language of summaries correct?	0.5	
<b>Special requirements</b>		
6. Are the aim and objectives clearly worded in the introduction?	1.0	
7. Does literature review correspond to the topic of the thesis? Is literature review comprehensive?	1.0	
8. Are materials and methods properly described?	1.0	
9. Are proper statistical methods applied?	0.5	
10. Is the presentation of results clear?	1.0	
11. Do conclusions correspond to the objectives and reflect the findings?	1.0	
11. Is dicussion clear and comprehensive?	0.5	
<b>Total</b>	<b>10</b>	

Strong points of the thesis.....  
 .....  
 .....

Weak points of the thesis.....  
 .....  
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.....  
Questions for the student .....

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.....

Other comments:.....

.....  
.....

Date.....

**Overall grade**.....

Reviewer .....(signature)

(academic degree, first name, last name)