



L-Università ta' Malta
Centre for Molecular
Medicine & Biobanking

M.Sc. Bioinformatics

Dissertation Guidelines (MMB5010)

(version 2024.11-2)

For queries regarding this document kindly contact Prof. Jean-Paul Ebejer on jean.p.ebejer@um.edu.mt

Table of Contents

1 Purpose.....	3
2 First Steps.....	3
3 Dissertation Formatting.....	4
4 Abstract.....	5
5 Introduction.....	5
6 Background and Literature Review.....	6
7 Methodology/Implementation.....	6
8 Results and Discussion.....	7
9 Conclusion.....	7
10 Appendices.....	8
11 References.....	8
12 Content Writing Tips.....	9
13 Dissertation Structure (Template).....	12
14 Dissertation Submission (prior to Viva-Voce).....	13
15 Other Student Resources.....	14

1 Purpose

This document outlines the comprehensive guidelines and requirements for the preparation, formatting, and submission of dissertations for [MMB5010](#), required for the successful completion of the M.Sc. in Bioinformatics programme at the Centre for Molecular Medicine and Biobanking (University of Malta). It is intended to guide students through each stage of the writing and formatting process to ensure clarity, consistency, and adherence to academic standards. This document also describes the dissertation submission process prior to the *viva-voce* examination.

2 First Steps

1. Preliminary Review

Before beginning the dissertation, students are strongly advised to review at least two or three distinction-level dissertations. This review provides valuable insights into the depth, structure, and content expected in a high-quality, postgraduate, scientific dissertation.

2. Ethics Clearance

Clearance from the CMMB Research Ethics Committee (CREC) is required prior to commencing the research project. Dissertations submitted without an approved URECA code will not be accepted. This code can be obtained by completing the Research Ethics and Data Protection (REDP) [online form](#).

3. Supervisory Guidance

The primary point of contact for students is their supervisory team. The guidelines in this document are provided for reference only and may be adapted at the discretion of the supervisors.

4. Initial Planning

The first step in preparing the dissertation is to draft a table of contents, outlining chapters and sections to a depth of three levels. This preliminary outline should be discussed with the supervisory team. Additionally, students should prepare a two-to three-page narrative summarizing the main scope and objectives of their work, which will aid in contextualizing the research.

5. Proofreading Requirements

Dissertations must be proofread and submitted free of grammatical and typographical errors. For students whose first language is not English, the use of professional proofreading and copy-editing services is strongly recommended.

6. Originality and Integrity

The dissertation must reflect the student's own, original work. The CMMB maintains a strict policy on academic integrity; for more information, please refer to the University of Malta's [plagiarism guidelines](#).

7. **Credits and Value**

The dissertation module (MMB5010) carries a value of **60 ECTS**.

8. **Writing Style**

Students are expected to use the first-person plural voice (e.g. "*We examine the performance of...*") in their writing.

9. **Active Voice**

The active voice should be used throughout the dissertation to enhance clarity. For example, use "*We developed a Python script*" rather than "*A Python script was developed*".

10. **Tense Usage**

The dissertation should generally be written in the present tense, with the exception of the Methodology chapter. Students should avoid mixing tenses within a single sentence.

11. **Software and Word Processing**

A modern word processor is recommended for writing the dissertation (e.g. TexStudio, LibreOffice Writer, Microsoft Word).

12. **Dissertation Timeline**

Plan the dissertation timeline carefully, ensuring sufficient time is allocated for the supervisor to review and provide feedback, typically **requiring four to eight weeks**.

13. **Supervisor Review**

Dissertation corrections may be provided on a chapter-by-chapter basis, subject to mutual agreement between the student and the supervisory team.

14. **Submission of Code and Datasets**

Any computer code or datasets developed during the research must be submitted electronically alongside the dissertation. For additional details, refer to Section 13.

15. **Templates**

A [LaTeX template for the dissertation](#) is available on GitHub. A Microsoft Word template is not currently available, but the final deliverable should be identical to the LaTeX template.

3 Dissertation Formatting

16. **Font and Size**

The dissertation should be typeset in **11pt Lato font**.

17. **Page Size**

Page size should be set to **A4**.

18. **Line Spacing**

The dissertation should be formatted with one-and-a-half line spacing.

19. **Margins**

The left margin should be set to 3.7 cm (for gutter space), and the right margin to 2.5 cm.

20. **Word Limit**

The maximum word limit for a 60-ECTS dissertation is **32,000** words. This limit

excludes appendices and references.

21. **Numbering**

The dissertation should use a four-level numbering system (chapter, section, subsection, subsubsection). The Table of Contents should display only the first three levels.

22. **Numbered Elements**

All chapters, sections, subsections, subsubsections, figures, equations, and tables must be numbered.

23. **Typesetting**

The dissertation should be typeset as single-sided.

24. **Chapter Summaries**

Each chapter, except for the Introduction and Conclusion, should conclude with a "Summary" section. Note: Do not label these sections as "Conclusion", as there should be only one conclusion chapter.

4 Abstract

25. **Length**

The abstract should be limited to a maximum of **one** page.

26. **Content**

The abstract is a comprehensive summary of the project, including key results. It should convey the significance of the work, a brief outline of the methodology, main findings, and the primary conclusions. Note: this section should focus on the project itself rather than the background.

27. **Timing**

The abstract should be written as the final step in the dissertation process.

5 Introduction

28. **Length**

The Introduction chapter should be around 4,000-5,000 words.

29. **Purpose**

The Introduction chapter provides a high-level overview of the project, aimed at giving readers and examiners context and motivating the study by explaining its importance, necessity, or usefulness.

30. **Research Question and Objectives**

A clear scientific research question must be explicitly stated, typically within the "Aims and Objectives" section.

- a) **Aims:** These encompass one or two primary goals of the project, often framed as research questions for scientific dissertations.
- b) **Objectives:** These are high-level descriptions of the experiments or actions necessary to achieve the aims and should exclude implementation details.

31. **Narrative Development**

The objectives guide the experimental narrative of the dissertation, with each experiment contributing to the overall story of the research.

32. **Approach Summary**

In the "Approach" section, the student should briefly outline the methodology used in the research, including datasets and evaluation methods if applicable. This section should remain high-level, as detailed explanations will follow in the Methodology chapter.

33. **Document Structure**

The Introduction chapter should conclude with a "Document Structure" section, which briefly outlines the contents of the remaining chapters in the dissertation.

6 Background and Literature Review

34. **Length**

The Background and Literature Review chapter should be around 7,000-9,000 words.

35. **Structure**

This chapter comprises two distinct sections:

- a) **Background:** Provides the necessary foundational information for understanding the dissertation. For example, if modelling a biological phenomenon with Random Forests, this technique should be explained here.
- b) **Literature Review:** Summarizes the current state of research in the relevant field. Key contributions from existing literature may be organized in a table for clarity.

36. **Relevance**

Only information relevant to the dissertation's focus should be included in this chapter (topics tackled should feature in the rest of the dissertation).

37. **Connection to Research**

The literature review should be connected to the student's research, presenting context rather than merely listing unrelated studies.

38. **References**

This chapter typically contains the highest density of references in the dissertation.

39. **Method Comparisons**

If the evaluation includes a comparison with methods developed by others, a concise description of each method should be presented here.

7 Methodology/Implementation

40. **Alternative Naming**

If the primary goal of the dissertation is to develop bioinformatics software rather than utilizing bioinformatics tools to derive molecular biology insights, the chapter can be titled "Implementation" instead of "Methodology".

- 41. **Length**
The Methodology chapter should be around 5,000-6,000 words.
- 42. **Purpose**
The Methodology chapter addresses the “How” of the research.
- 43. **Reproducibility**
The methodology should be described in sufficient detail to enable reproducibility by the reader.
- 44. **Code**
Unless integral to the methodology, computer code should not be included in this chapter.
- 45. **User Manual**
This chapter is **not** intended to serve as a user manual for running software; any such instructions should be included in an appendix.
- 46. **Visual Outline**
The Methodology chapter usually begins with a schematic or diagram of the research approach or architecture, followed by an explanation of each component.

8 Results and Discussion

- 47. **Length**
The Results and Discussion chapter should be around 7,000-9,000 words.
- 48. **Content**
This chapter presents the results of the experiments, with discussion interwoven immediately after each result is presented, rather than in a separate section.
- 49. **Comparative Evaluation**
If a computational method was developed, it should be evaluated against similar methods. Depending on the scope, this may be a section within this chapter or a standalone Evaluation chapter.
- 50. **Alignment with Objectives**
The structure of the Results and Discussion chapter should reflect the objectives stated in the Introduction and cover the experiments conducted to achieve these objectives.
- 51. **Data Presentation**
Major results should be illustrated using figures or tables. Supplementary results may be included in an appendix.

9 Conclusion

- 52. **Length**
The Conclusion chapter should be around 2,000-3,000 words.
- 53. **No New Information**
No new information should be introduced in the Conclusion chapter.

54. **Summary of Findings**

The Conclusion chapter should synthesize the study's main findings.

55. **Reflection on Aims and Objectives**

The student should revisit the aims and objectives, assessing to what extent they were accomplished.

56. **Critique and Limitations**

This section should identify limitations or challenges encountered during the study.

57. **Future Work**

This section outlines potential directions for further research, describing meaningful expansions beyond minor parameter adjustments. It should highlight innovative, exploratory areas for future investigation based on the dissertation's findings.

58. **Concluding Remarks**

The Concluding Remarks section is a brief paragraph with a personal reflection that summarizes the project's significance on a positive note.

10 Appendices

59. **Assessment**

Content included in the appendices is **not** subject to examination.

60. **Purpose**

Appendices should include supplementary information relevant to the study, supporting but not essential to the main content.

61. **Quantity**

Multiple appendices may be used if needed.

62. **Content**

Material suitable for appendices includes, but is not limited to: software user manuals, installation instructions, descriptions of digital resources, detailed mathematical methodologies, and secondary results.

63. **Code**

Unless specifically relevant to the contents of the dissertation, computer code should not be presented in an appendix but should be submitted as a deliverable with the dissertation (and deposited on GitHub).

11 References

64. **Style**

The dissertation should employ the **APA Reference Style**. This style sorts citations by the author's last name. Note that the LaTeX template automatically uses this style.

65. **Reference Type Information**

Each reference type (e.g. book, website, journal article, *etc.*) should include a consistent set of fields (e.g. all journal articles should contain the same information

such as title, author, year, volume, issue, pages, etc.).

66. Reference Consistency

Ensure all references are consistent in format (style).

67. Completeness

References should include page numbers and volume information where applicable.

68. Source Quality

When citing, Wikipedia or other non-scholarly sources (e.g. blog posts) should be avoided.

69. Referencing Styles

a) Narrative In-text Citations: Reference is part of the sentence (e.g. "Ebejer *et al.* (2024) demonstrate that Earth is a sphere").

b) Parenthetical Citations: Reference is placed at the end of the sentence in parentheses (e.g. "This has been shown previously (Arrighi, 2000; Withers-Martinez *et al.*, 2024)").

70. Author Attribution

Cite only the first author explicitly, using "*et al.*" for additional authors.

71. Order

List references alphabetically by the first author's surname for ease of use by examiners.

72. Management System

Students are encouraged to use a reference management system, such as Zotero or BibLaTeX (for LaTeX), to maintain consistency in their references.

12 Content Writing Tips

73. Contractions

Contractions should be avoided (e.g. use "will not" instead of "won't").

74. Latin Abbreviations

Latin abbreviations should be italicized.

75. Specific Terms

When referring to specific instances, capitalize terms such as Equation, Figure, Table, Section, and Chapter (e.g. "Figure 3").

76. Titles

Titles should be concise (less than 12 words) and impactful.

77. Dissertation Title

Ensure the dissertation title is not hyphenated, especially on the title/cover page.

78. Number Formatting

Write numbers zero through ten as words; use numerals for higher values.

79. Thousands Separator

Use a comma as a thousands separator in numerals (e.g. 1,234).

80. Alignment in Tables

Right-align numbers in tables to facilitate comparison.

81. **Sentence Start**
Avoid beginning sentences with numerals.
82. **Decimal Places**
Use a consistent number of decimal places when reporting results (typically three for scientific writing).
83. **Citations for Figures/Tables**
For figures or tables sourced from others, use “reproduced from” followed by the citation. If modified, use “adapted from.”
84. **Permission**
Permission must be obtained from copyright holders (e.g. journals) to reproduce images.
85. **Captions**
Provide captions for all figures and tables.
86. **Capitalization**
Follow capitalization rules consistently for section titles and headings.
87. **Section Transitions**
Include introductory text between sections to explain upcoming content and its relevance.
88. **Cross-referencing**
Cross-link sections within the dissertation. Repetition is acceptable across chapters but should be avoided within a single chapter.
89. **Repetition**
Avoid redundant wording or phrases within the same sentence.
90. **References in Text**
Reference each figure, table, or equation in the text and place them close to where they are mentioned.
91. **Caption Quality**
Captions should provide a comprehensive summary of the figure or table. A good dissertation can be read-only using the figures/tables only.
92. **Footnote Use**
Use footnotes appropriately, such as for URLs.
93. **URL Citation**
Include “Last Accessed” dates for URLs and online resources.
94. **Footnote Placement**
Place footnotes outside of adjacent punctuation (e.g. after a period or comma).
95. **Footnote Spacing**
Avoid spaces between the word/punctuation and the footnote mark.
96. **Paragraph Length**
Keep paragraphs concise, each expressing a single point, and ensure sentences are direct and not overly long.
97. **Conciseness**
Avoid unnecessary words. Replace vague and unscientific terms like “very” with more precise language (e.g. “very tired” becomes “exhausted”).

98. Logical Order in Lists

Use “First,” “Second,” *etc.*, consistently to establish a clear sequence.

99. Avoid Hanging Lists

Avoid listing items without introductory text, and ensure headings do not appear at the bottom of a page with no text following them.

100. Grammar

Use correct grammar, distinguishing terms such as “which” vs. “that” and “where” vs. “were”.

101. Directional Terms

Avoid “above” and “below” when referring to sections, tables, figures, or equations.

102. Equation Terms

Define and explain each term in an equation immediately following its introduction.

103. Backups

Regularly back up the dissertation in multiple locations to avoid data loss.

104. Specific Cross-references

Use precise cross-references (*e.g.* to specific sections or chapters).

105. Figure Quality

Ensure figures are high-resolution and easily readable. All text on a figure must be readable.

106. Statistical Measures

When reporting a mean, include a measure of spread, such as the standard deviation or standard error.

107. Spacing with Units

Insert a non-breaking space between numbers and units (*e.g.* 32 GB), except with percentages (*e.g.* 50%).

108. Highlighting Results

In tables, emphasize the best-performing results (*e.g.* by using bold text) to guide reader focus.

109. Punctuation

Avoid spaces before question marks, exclamation points, or other closing punctuation.

110. Spacing after Periods

Use a single space after periods (full stops). Modern typesetting software adjusts this spacing automatically.

111. Headings

Avoid ending headings or titles with periods.

112. Page Numbers

Include page numbers on all pages.

113. Front-Matter Paging

Roman numerals should be used for pages in the Front Matter (see Dissertation Structure). The rest of the dissertation should use Arabic numbering.

13 Dissertation Structure (Template)

114. The dissertation may follow this structure:

- a) [Front Matter] (note that there is no explicit such chapter title)
 - 1. Cover page
 - 2. Dedication
 - 3. Acknowledgements
 - 4. Abstract
 - 5. Table of Contents
 - 6. List of Figures
 - 7. List of Tables
 - 8. List of Abbreviations
- b) Introduction
 - 1. Motivation
 - 2. Aims and Objectives
 - 3. Approach
 - 4. Document Structure
- c) Background & Literature Overview
 - 1. [Many background sections]
 - 2. Related Work
 - 3. Summary
- d) Methodology [or Implementation]
 - 1. [An overview of the Methodology including schematic]
 - 2. [Each step of the overview is described in a separate section]
 - 3. Summary
- e) Results and Discussion
 - 1. [Experiment 1]
 - 2. [Experiment 2]
 - 3. [Experiment 3] etc.
 - 4. [Evaluation]
 - 5. Summary
- f) Conclusion
 - 1. Revisiting Aims and Objectives
 - 2. Critique and Limitations
 - 3. Future Work
 - 4. Final Remarks
- g) Appendices
- h) References

14 Dissertation Submission (prior to Viva-Voce)

115. Submission Deadline

Students **must** submit their dissertation and all related artefacts by the given deadline. Only deadline extensions approved by the CMMB board will be considered.

116. Digital-Only Submission

All submissions (prior to the viva-voce) **must be completed digitally**. No hard copy of the dissertation or artefacts is required.

117. Submission Format

The dissertation report must be submitted as a PDF document.

118. Submission Process

The submission process involves **two** distinct steps:

- Uploading the dissertation document to the Virtual Learning Environment (VLE) for plagiarism checking via Turnitin.
- Submitting all artefacts (e.g. documentation, code, data, plagiarism form, and any other relevant materials) to the CMMB administrative contact **via email**.

119. VLE Submission

Two separate upload areas will be provided in VLE:

- Draft Dissertation / Thesis: The Draft Dissertation area is intended for checking individual chapters for plagiarism using Turnitin.
- Final Dissertation / Thesis: The Final Dissertation area is for submitting the complete dissertation for a final plagiarism check.

The Chairperson of the Board of Examiners will download the plagiarism report and include its findings in the final assessment report.

120. Submission Email to Administrative Contact

- All files must also be sent to the CMMB administrative contact via email at cmmb@um.edu.mt.
- All supervisors **must** be copied (CC'ed) in the submission email.

121. File Requirements

Only **three** files should be sent via email to the administrative contact:

- Dissertation document:** Submit the report **in PDF format** with the file name structured as: YYYYMM_mmb5010_studentname_report.pdf
- Code and data Archive:** Submit all relevant code and data in an archived and compressed format. Use the following file naming convention: YYYYMM_mmb5010_studentname_codeanddata.tgz
- Signed copy of the plagiarism form:** Submit the completed UM [Authenticity of Dissertation form](#). Note that this should **not** be included as part of the dissertation. Use the following file naming convention: YYYYMM_mmb5010_studentname_authenticity.pdf

122. File Size Limitations

- If the submission files are too large for email (e.g. due to data size), upload them

- to a cloud service (e.g. Dropbox, Google Drive, Microsoft OneDrive).
- b) Include the download link in the submission email.
 - c) The administrative contact will download the files on the submission day and make them available to the Board of Examiners.

123. **Code Submission**

If code is hosted on an online repository (e.g. GitHub) this should be tagged as “dissertation_release”. A copy of the code must still be submitted along with the report (as described above).

15 Other Student Resources

- 124. [Abstract writing](#).
- 125. [LaTeX tips](#).
- 126. [Viva-voce tips](#).