GHENT UNIVERSITY

Course Specifications

Valid as from the academic year 2025-2026

Master's Dissertation (C003721)

Course size *(nominal values; actual values may depend on programme)*

Credits 30.0 **Study time 900 h**

Course offerings in academic year 2025-2026

A (Year)	English	Gent

Lecturers in academic year 2025-2026

Offered in the following programmes in 2025-2026	crdts	offering
Master of Science in Bioinformatics(main subject Systems Biology)	30	A

Teaching languages

English

Keywords

Scientific research, research techniques, scientific reporting, written manuscript, oral presentation.

Position of the course

Master of Science in Bioinformatics: Systems Biology
The thesis aims at acquiring some general competences (interdisciplinary attitude, planning, communication, presentation skills, scientific knowledge, programming skills etc.). The thesis topic usually requires an independent and creative research attitude before one can come to a technical solution. The development of research skills and attitudes are therefore of major importance for the Master's Dissertation. In addition, the student has to learn how to function well within a research group. The scientific research for the Master's Dissertation can be performed at any research group at Ghent University that can pose well defined bioinformatics research questions. Topics proposed by the different research labs will be evaluated by the interfaculty education committee of the Master of Science in Bioinformatics. Only those topics that meet the prespecified objective and unambiguous criteria regarding guidance and content (see final competences) defined for the track Master of Science in Bioinformatics: Systems Biology will be withheld. If the interfaculty education committee judges it necessary, an interested promoter teaching in the Master of Science in Bioinformatics, or with a proven track record in bioinformatics may have to be assigned.

Contents

The Master's Dissertation is a written report of the scientific research the student has conducted. This manuscript contains the following items, similar to the structure of a scientific publication:

- preface
- table of contents
- list of abbreviations
- abstract
- introduction
- relevant literature: should contain only what is necessary to understand the work, with a focus on a critical synthesis
- materials and methods: trivial and well known methods should not be explained in detail
- results: raw data can be delivered in an electronic format
- discussion

- general conclusions
- recommendations for further research
- list of references
- appendices (only in an electronic format)

Initial competences

The competences that can be expected from a Bachelor of Science in Bioscience Engineering, Bachelor of Science in Biochemistry and Biotechnology, or any curriculum that is equivalent with the latter ones, supplemented with a thorough scientific basic knowledge (including bioscience engineering competences) and knowledge of research techniques in the field of bioinformatics.

Final competences

1 The student can formulate a scientific research problem and clear reseach questions and/or desired properties of a certain bioinformatics prduct or service (if applicable), and translate it into a suitable research design.
2 The student can search for scientific literature, critically analyse it and integreate it into the research.
3 The student can accurately collect, manage, process, analyze and synthesize data using an appropriate methodology for the research questions (or product to be developed): split up the problem into the relevant subproblems, search for/select and apply the best suited principles/methods for these subproblems, and combine them successfully to tackle the main research problem, taking into account the limitations (e.g. computationally, confidentiality issues, ethical problems, ...).
4 The student can critically evaluate research results, draw conclusions and propose improvements or further research.
5 The student can clearly communicate the research results in written and oral form, both to a specialized and a broader audience, and can substantiate, defend and discuss these results within a scientific context.
6 The student can apply scientific integrity in all phases of the master's dissertation and make ethically responsible choices when collecting, analyzing and communicating research data. He/she reflects critically on the possibilities and limitations of artificial intelligence and digital tools within the research and uses these where relevant in a transparent and responsible manner.
7 The student shows the necessary independence, motivation, dedication and initiative, can function well within the research group and can collaborate constructively with fellow researchers.
8 The student demonstrates problem-solving skills and flexibility to adjust its research and integrate new insights.

Conditions for credit contract

This course unit cannot be taken via a credit contract

Conditions for exam contract

This course unit cannot be taken via an exam contract

Teaching methods

Master's dissertation, Work placement

Study material

None

References

- Practical Research: Planning and Design by Paul D. Leedy & Jeanne Ellis Ormrod, 2009, Prentice Hall. ISBN 9780137152421

Course content-related study coaching

The Master's Dissertation is actively coached by the promoter(s) and tutor(s) during counseling meetings, during which the work as well as the ongoing learning process involved are reviewed.

Assessment moments

end-of-term and continuous assessment

Examination methods in case of periodic assessment during the first examination period

Oral assessment, Assignment

Examination methods in case of periodic assessment during the second examination period

Oral assessment, Assignment

Examination methods in case of permanent assessment

Participation

Possibilities of retake in case of permanent assessment

examination during the second examination period is possible

Extra information on the examination methods

All students are expected to consult and apply the faculty code of conduct for the use of GenAI during the master's dissertation. The study programme, supervisor or promotor will communicate any deviations or additions to these faculty guidelines directly to students through the usual UGent-channels.

Calculation of the examination mark

- The oral examination consists of an oral presentation, interactive discussion, deliberation.
- Exact evaluation criteria and thesis format will be defined by the interfaculty education committee of the Master of Science in Bioinformatics by merging the criteria of the different faculties involved.
- Criteria should be in accordance with those of the faculties responsible for the followed track i.e. Faculty of Science.

The score is calculated as a weighted average with a contribution of the learning process of 30%, the thesis text of 40% and the defense of 30% (10% presentation, 20% Q&A). In order to pass the Master's Dissertation, one must have passed each component (process, product, presentation). If one does not pass one or more of these components, one cannot pass the Master's Dissertation and the final grade will be reduced to a non-deliberative grade.