



UNIVERSITÀ DEGLI STUDI DI MILANO
CORSO DI LAUREA MAGISTRALE IN
BIOTECHNOLOGY FOR THE BIOECONOMY

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Guidelines for the Degree Internship (DI) and the Final Examination of Biotechnology for the Bioeconomy (GBC/G64, BforB)

The master's degree in Biotechnology for the Bioeconomy (GBC/G64, BforB) is achieved through a Final Examination, which consists in the public discussion of a Dissertation reporting the results of the activities carried out during the Degree Internship (DI). The DI accomplishment and the Final Examination account for 36 CFU. One CFU corresponds to a student's time commitment of a minimum of 25 hours.

Learning outcomes

The DI and the Final Examination represent a unique and personalized training activity in which each student, with the guidance of a Supervisor ("*relatore*"), has the opportunity to learn the scientific work method and its application in the DI project.

The scientific work method includes several aspects, which can be summarized as follows:

- Focus on a topic according to the scientific approach typical of the discipline in which the Supervisor is working;
- Development of a scientific and technical path: identification of the problem, critical examination of scientific literature, choice of information and preparative and analytical methods, learning of tools and operating methods for data production/collection, data processing, discussion of results, elaboration of conclusions;
- Experience and use of the software necessary for the creation of the Dissertation paper and its presentation: spreadsheet, word processing, slide presentation, etc.

The Degree Internship (DI)

In general, DI choice should be driven by the interest in a particular field faced by the students during both first and second year of the BforB programme. The topics of interest are the starting point for the search of teachers/laboratories to be contacted in order to know about the DI projects availability, timing and technical modality. Some DI opportunities can also be published here <https://www.unimi.it/en/study/traineeships-and-work/cvs-job-offers-and-internships>, in the MS Teams BforB BULLETIN Board, and the web page under the Biotechnology for the Bioeconomy Programme website appositely dedicated to the internship offers (<https://biotechnologybioeconomy.cdl.unimi.it/en/study/graduating>).

The DI can be carried out in a laboratory either inside or outside the University of Milan (UniMi).

The DI must be developed under the guidance of the Supervisor ("*relatore*"). The Supervisor must be a UniMi teacher preferably belonging to the BforB teaching board. In case the chosen Supervisor does not belong to

the BforB teaching board, students must ask a preliminary approval from the Academic Guidance Tutors. The Supervisor is usually flanked by a Co-supervisor ("*correlatore*") who is generally the person who supervises the student in detailed practical aspects of the DI. The Co-supervisor can be a University teacher, a PhD student, a postdoc or fellowship holder, a laboratory technician, or the Host Institution Tutor (see below).

The DI project must include experimental activities (including practical laboratory, on-field research activity, and in silico research activities), assigned by the Supervisor in line with the required commitment (36 CFU). The DI experimental project is usually carried out during the second year of the course together with the other BforB training activities. The DI duration is typically required to be at least six months when the commitment is on a full-time basis; for any lesser commitment, the duration will be proportionally extended, with the final overall duration to be agreed upon with the supervisor. All the DI activities must be scheduled in agreement with the Supervisor and the Co-supervisor. In the case the DI is performed outside UniMi (see below), it is suggested to plan it in due advance.

The DI search is accomplished autonomously by the student. The Academic Guidance Tutors of BforB can help the student in addressing this search.

If the DI is carried out outside UniMi, in a laboratory belonging to a private or a public institution/organisation/company (i.e. the Host Institution), the Host Institution must previously undertake a formal Internship Agreement ("*Convenzione di Tirocinio*") with UniMi. Moreover, a Training Programme ("*Progetto Formativo*") has to be approved by a member of the BforB teacher board (usually the Mobility Tutor) that will be the Academic Tutor, according to the procedure activated for the Curricular Stages and headed by the Stage/Internship Office of the University (COSP; see both <https://www.unimi.it/en/study/traineeships-and-work/traineeships-and-internships> and <https://www.unimi.it/en/study/traineeships-and-work/traineeships-and-internships/activating-curricular-internship>). Pay attention that in the frame of the COSP procedure, the Academic Tutor will be the DI Supervisor ("*relatore*"), while the Host Institution Tutor will be the Co-supervisor ("*correlatore*").

The DI can be also carried out, in whole or in part, abroad, in a laboratory chosen together with the BforB Erasmus and International Mobility Tutor through well-established procedures. Please refer to the specific guidelines for the Erasmus Stage, for other international training programs or other foreign internships assisted by the International Mobility and Promotion Office or the COSP office. In these cases, the internship will be generally tutored by the BforB Erasmus and International Mobility Tutor as claimed by the specific office procedures. The role of the DI Supervisor ("*relatore*") will be assigned by the Mobility Tutor to a UniMi teacher, selected on the basis of the topic of the activities carried out abroad. The foreign Tutor can act as the Co-supervisor ("*correlatore*"). Any internship carried out abroad must be formally registered in the student's academic record in order to be validated. The BforB Erasmus and International Mobility Tutor is responsible for handling this registration.

To start attending a laboratory or any other experimental activity, students must possess the certificate of the 4-hour general safety training course.

As a general rule, if the period of stay at the foreign laboratory or at the laboratory outside UniMi is less than six months long, the student should complete the thesis work at the laboratory of the DI supervisor, or other laboratory indicated by the DI supervisor, in order to complete the training program.

The start and the end of any DI must be formally certified by the Supervisor (see <https://www.unimi.it/en/study/traineeships-and-work/traineeships-and-internships/tutors-curricular-internships-and-ects-credits/agricultural-and-food-sciences-internships>). Once the document certifying the starting of DI has been signed by the student and the Supervisor, it must be sent, through "Informastudenti" (<https://informastudenti.unimi.it/saw/ess?AUTH=SAML>) platform to the Student Office ("Agricultural and Food Sciences Course Administration"), by selecting any inquiry category, for example "Lesson timetable..." ("Orari sedi delle lezioni....."; the inquiry will be properly sorted on the basis of student code number).

The Dissertation

The DI must be addressed and finalized with the preparation of a Dissertation which must be conceived as a scientific publication¹, under the guidance of the Supervisor and/or Co-supervisor. The final version of the Dissertation must be validated by the Supervisor well ahead of the Final Examination.

The Dissertation includes several sections, usually divided as follows:

a) Title Page. It should contain the names of the University (including the logo), Faculty, Master's Programme, Supervisor, Co-supervisor, Student Candidate (and his/her UniMi identification number), and the academic year, as well as the title of the Dissertation. It will be the cover of the printed copy and the first page in the pdf file. The title should be straightforward and informative, and possibly less than 150 characters.

b) Index.

c) Abstract (approx 500 words). It includes a general short introduction to the topic, a clear purpose statement, and a brief non-technical summary of the objectives, main results and their conclusive implication. Specialized terms and abbreviations should be avoided as much as possible.

d) Introduction (approx 10.000 words): a survey of the scientific studies and knowledge already achieved and published on the subject of the work, useful to address the purpose of the DI, citing the appropriate references.

e) Purpose (approx 500 words): the general DI purpose and the motivated structure of the experimental work. The purpose must be stated in a precise and unambiguous way, avoiding vague or generic descriptions.

f) Materials and Methods: the experimental procedures that have generated the data (subsequently described in the results part) has to be detailed with sufficient information to permit a reader to repeat properly the experiments. It does not describe how the procedures should be done, but how the procedures were carried out during the DI, reporting the proper references and highlighting the adopted methodological variations, if any.

g) Results and Discussion (approx 15.000 words plus tables and figures): it should describe the data collected as results with the help of tables, figures (e.g. graphs, schemes), and it has to interpretatively comment singularly the reported results. Any figure and table must be cited in the text and provided with comprehensive, self-explanatory captions.

h) Conclusion (approx 1000 words): main conclusions that can be supported by the results which fulfil the stated objectives.

i) Bibliography. No precise format is needed for the short citation in the text and for the full citation here in the bibliography section, but a uniform format must be used.

l) For figures and tables and whatever not mentioned here use the same style/format generally adopted in the scientific literature.

The number of words mentioned for the different dissertation sections is merely indicative. The font size should be 11 or 12 pt.

¹ To get a general idea and cue on how a scientific publication can be conceived, the following link is provided merely as an example among the many available: Turbek, S.P., Chock, T.M., Donahue, K., Havrilla, C.A., Oliverio, A.M., Polutchko, S.K., Shoemaker, L.G. and Vimercati, L. (2016), Scientific Writing Made Easy: A Step-by-Step Guide to Undergraduate Writing in the Biological Sciences. Bull Ecol Soc Am, 97: 417-426.

<https://esajournals.onlinelibrary.wiley.com/doi/10.1002/bes2.1258>

The entire Dissertation must be written in English. If desired, a version of the abstract written in the student mother tongue can be also included together with the English version.

Please refer to the section “Graduating” on the BforB web site for all the other formal and administrative aspects not mentioned in these guidelines:

<https://biotechnologybioeconomy.cdl.unimi.it/en/study/graduating>.

The Final Examination

The Degree in Biotechnology for the Bioeconomy is achieved in front of a Board by passing a Final Examination, consisting of a public discussion of the Dissertation, written by the student under the guidance of the Supervisor and Co-supervisor. The Board is specifically designated for the examination and it is composed of five UniMi teachers and authorised experts.

In the Final Examination, the Candidate student has to present his/her dissertation in a 10-15 minutes' speech, highlighting the purpose of the work done, the procedures he/she has used, the skills acquired, the results he/she has obtained and how they led to the stated conclusions. The use of a slide presentation is requested to effectively deliver the presentation. At the end of the presentation, the Candidate has to reply to questions and comments raised by the Board Members regarding the work exhibited in the speech and published in the Dissertation.

The Board will assign an overall Degree Internship score up to 10 points divided as follows:

- Points at the discretion of the Board, up to a maximum of 5
- Points at the discretion of the Supervisor, up to a maximum of 5.
- One additional reward point will be given for Erasmus or an analogous abroad experience. In any case, the final score cannot exceed 10 points.

The DI score will be summed to the exam score calculated as a weighted average on 110 total points. The award of honours can be proposed by the President of the Board on the basis of the achieved total score, the presence of honours in the career and other factors of merit, and is subjected to the unanimous consent of the Board.

Degree Internship and Final Dissertation as a contingency measure during the SARS-CoV-2 pandemic and other emergencies

BforB DI project should be in principle carried out through an experimental research activity (including practical laboratory, on-field research activity, in silico research activity).

However, the teacher board approved that exceptionally, only in the case of laboratory accessibility restrictions for the SARS-CoV-2 pandemic emergency as stated by the Italian law and academic rules, students can perform the DI also through smart-working modality consisting of a literature survey previously agreed and monitored by the Supervisor. In any case, the student effort must correspond to 36 CFU, and the Final Examination score will not give any penalty as compared with experimental work-based DI.

The Dissertation can have the overall length and chapters as described above, and can have the structure of a scientific mini-review of the literature. By analysing the available scientific literature on a given topic, the students have to report, correlate and discuss the main results emerged from published research works demonstrating the achievement of the aims declared in the Dissertation and proposing conclusions and future perspectives.

Concerning possible temporary restrictions given by the Authorities' measures, blended DI are also allowed, with an experimental part and a more expanded introduction part whenever required to achieve the 36 CFU commitment. Also in this case, for the Dissertation preparation refer to the overall structure and length described above.