



Freie Universität Bozen
Libera Università di Bolzano
Università Lìedia de Bulsan

Faculty of Science and Technology

PhD programme in FOOD ENGINEERING AND BIOTECHNOLOGY

Website: <https://www.unibz.it/en/faculties/sciencetechnology/>

Duration: 3 years

Academic year: 2020/2021

Start date: 01/11/2020

Official language: English

Programme contents

The Ph.D. in Food Engineering and Biotechnology is a full-time programme. The Ph.D. thesis has to be written in English and accompanied by German and Italian abstracts. Ph.D. students should benefit from the special multilingual opportunities offered by the University, which include activities/events in Italian, German or other languages (e.g., seminars, optional courses, social events). The Ph.D. programme comprises lectures and research activities that can be completed both at the Free University of Bozen/Bolzano and at universities abroad. The time spent abroad can be at one of the foreign universities where foreign members of the Ph.D. Course Committee are coming from or at other universities or research centres.

The Ph.D. programme is based on the following milestones:

- students develop and organize their research plan, including the state-of-the-art of their research topic, in the first six months of the course together with their supervisor or co-supervisors. At the latest after six months, students must defend their research plan in front of the Ph.D. Course Committee;
- students have to take part in at least one international conference where they are expected to present a paper or a poster;
- students must spend at least six months abroad conducting research;
- students must attend specific compulsory courses, focused on the analysis of literature and writing scientific articles and on advanced statistics as well as other courses or summer schools courses approved by the PhD Course Committee, and pass the relevant exam. Being admitted to the Ph.D. course with an English certification of level B2 and being required the level C1 at the end of the three-year course, students must attend an English offered by the language Center of the unibz focused on the preparation and achievement of this final level of English language.

In order to be admitted to the final exam, students must have published or submitted for publication in international peer-reviewed journal at least three articles where they figure as the main author. Exceptions to this rule, if adequately motivated, will be evaluated and eventually approved by the Academic Board.

Stages of the PhD

The research activities are spread over five stages, respectively, after 2, 6, 12, 24 and 36 months. At the end of each stage, students have to meet the Ph.D. Course Committee to present their project and the updating of the results. The Ph.D. Course Committee assesses students' work and provides suggestions if needed.

First stage (first 2 months): the Ph.D. Course Committee meets the students, indicating the supervisor. The student with the supervisor decide on his research topic within the areas listed in this advertisement. Students also work on a study plan that has to be approved by the Ph.D. Course Committee.

Second stage (2nd -6th month): students, after an exhaustive review of the literature concerning their subject area, have to prepare their research programme that has to be approved by the Ph.D. Course Committee. Students will follow courses that are relevant to their individual study plan. Students prepare their public seminar that will take place at the Free University of Bozen/Bolzano, where they discuss the state-of-the-art of their research topic.

Third stage (6th -12th month): students start their research in the lab and/or field, and can also attend courses and summer schools. They will also present to the Ph.D. Course Committee their research programme that they want to conduct abroad in the following year and propose a co-supervisor at the foreign university or research centre for approval and makes a report about the first-year activities.

Fourth stage (12th -24th month): students continue their research and finish any courses that they have been following. At this stage, it is likely that some of this time will be spent abroad. At this stage or in the next, students are also expected to attend international conferences to present their results, also starting the preparation of the manuscript(s) for publication in peer-reviewed journals. The student presents to the Ph.D. Course Committee a report about the second-year activities.

Fifth stage (24th-36th month): students finish their research and any experiences abroad; they finish writing the manuscript(s) that are to be published and finish their thesis. To be admitted to the final exam the student has to present to the Ph.D. Course Committee a report about the third-year activities and about his final thesis.

Research areas

The following research areas, including sub-headings, are considered in the Ph.D. on Food Engineering and Biotechnology.

Primary food production

This issue mainly concerns those foods that are not subjected to technology processing, and their relationships with the agriculture and environmental features. The main goal is to focus on natural, sustainable and high performing processes and products. Non-restrictive examples of related research areas are as follows.

Renewable technologies and sensors in agriculture engineering; precision agriculture; identification of microbial and plant metabolic markers in response environmental stresses and nutritional supply; thermo-conversion of agriculture and food by-products for the production of chemical compounds.

Set-up, management and validation of food processes

This issue mainly concerns food processing, with particular emphasis to the set up, and consequent management and validation, of novel processes for the manufacture of products with very high quality sensory, rheology, hygiene and nutritional attributes. Non-restrictive examples of related research areas are as follows.

Optimization of structure, aroma and hygiene food attributes; point-of-care diagnostic for food traceability, quality assessment and smart packaging; application of non-thermal technologies and rapid methods (e.g., electrochemical biosensors); sensors and management tools for predictive maintenance applications in agrifood industries; food microstructure engineering; biotechnology production of natural foods through the gene and enzyme conditioning; conditioning of the chemical changes of food compounds with high nutritional value; design and evaluation of on-farm drying processes for delicate vegetable products.

Application of the omics techniques

This issue mainly concerns the application of food omics platforms (meta-genomics, proteomics and/or metabolomics) for conditioning and characterizing food processing and products, with particular emphasis towards fermented foods. Omics platforms will deserve an interest also to characterize the food-human axis, aiming at strengthening the role of the gut microbiome. Non-restrictive examples of related research areas are as follows.

Functional characterization of foods and related microbiota for the manufacture of fermented foods; set-up of microbial food processes for improving the nutritional and functional attributes; characterization and use of chemical nutrients that affect the response by the human gastrointestinal microbiome; exploitation of the potential of food by-products.

Admission requirements - Evaluation criteria for examinations/qualifications

Degrees from the old Italian system: all

Master (laurea specialistica/magistrale): all

Foreign degrees

Applicants who have done their degrees abroad must have university education of at least five years and hold the prerequisites listed below.

Other:

The prerequisites for admission to doctoral programmes are related to having achieved an appropriate educational, and/or cultural background, and/or have worked in the Ph.D. course areas of research.

Qualifications in food science, agriculture, biotechnology and food engineering are preferable.

Admission to the program is based on the assessment of applicants through:

- CV and academic qualifications;
- their cover letter, mainly based on the motivation for applying to this Ph.D. program;
- interview.

The B2 level of English has to be certified. You can demonstrate your language proficiency in the application portal (in the section "upload language certificates" and/or "enrol for language exams") after you have created an application in the section "create/manage applications". In case your final certificate has been awarded by an **Italian** public institution, you need to submit a self-declaration.

In case your final certificate has been awarded by a **foreign** public institution, you need to upload diploma scanned copy of the original.

You can demonstrate language proficiency through:

1. **the main teaching language in your final high school year** if German, Italian or English (recognised as C1) (Latin upper secondary schools: recognised as B2 in German and Italian).
2. **a bachelor or master degree** in Italian, German or English (recognised as C1). unibz graduates must upload the language certificates obtained and/or declare that they have passed language exams at the unibz Language Centre (B2, B2+ or C1)
3. **a recognised language certificate** (see the list of recognised certificates: <https://www.unibz.it/en/services/language-centre/study-in-three-languages/>) If you cannot upload the certificates, you can send them by e-mail as PDF files or deliver them in person to the Language Centre by the application deadline (see "Deadlines" section).
4. **language exams organised by the unibz Language Centre**. You can register for these exams online through the application portal (in the section "enrol for language exams") after you have filled out your application in the section "create/manage applications". The registration periods are indicated in the "Deadlines" section. If you start your application outside a language exams registration period, you must return to the portal during one of the periods indicated above in order to register for an exam.

Information regarding the structure of the language proficiency exams, their duration, their administration, and typical processing time for the publication of the results can be found on the following webpage: <https://www.unibz.it/en/services/language-centre/language-exams/>.

To apply for the PhD program, applicants must include the following:

- personal statement letter written in English (max. 1 page).
- Curriculum vitae (CV) (in English and possibly following the EU format that can be downloaded here <https://europass.cedefop.europa.eu/en/documents/curriculum-vitae>).
- Master degree certificate/exam transcript.
For admission, the (exams) average grade of master's degree (or equivalent) must be greater than or equal to 24/30. For foreign degrees, if the marking system is different, the mark will be transformed. In case of Italian university titles the certification MUST be substituted by a self-declaration or by the Diploma Supplement.
- English Language certification at level B2.

Other documents to be included in the application if available:

- reference letters, written in Italian, German or English from a university lecturer or a researcher from a research institute;
- List of publications (published, being published or submitted for publication), with related links, if possible.

Only the applicants with the above mentioned pre-requisite will be taken into account. The Evaluation Committee will first evaluate the CV, the personal statement letter and the applicant's qualifications - including publications (if any) - taking also into account the appropriateness of the candidates' profiles with the PhD program research areas, and will then draw up a list of applicants admitted to the next stage of the selection process. This will consist of an interview, in which their basic knowledge in one or more research areas of the Ph.D. program will be assessed. The interview can

make use of media such as video-conferencing, telephone and the like. The Committee will select the best applicants on the basis of a comparative assessment.

The following points will be awarded:

- up to 10 points for: the applicant's CV, cover letter and qualifications;
- up to 10 points for the appropriateness of the CV regarding the research areas of interest for the PhD program;
- up to 20 points for the interview.

The final score is the sum of the previous scores. The maximum score is 40. The lowest score to be admitted to the rank list is 20/40. The final score is used for the ranking of applicants and to establish access to the PhD Programme and who will receive grants.

A lot will be drawn to decide on the allocation of places. The ranks list will be published on the website of unibz (www.unibz.it/phd).

Examination dates

Description	Date	Place
Personal Interview	From 22 nd to 30 July 2020	Via Microsoft Teams

Positions and grants

Total positions:	10
Positions with grants from the University:	6
Positions with other grants:	2
Positions with no grants:	2

PhD scholarship bound to specific research topics/areas:		
Topic/Area	Positions	Founder
Sustainable technologies and sensors for food applications	0,5	Istituto Italiano di Tecnologia
Selection of microorganisms and development of the process for the production of a vaginal/neonatal psychobiotic gel.	0,5	Giuliani AG
Comparative genomics of Phytoplasma strains for the determination of virulence factors	1	Research Centre "Laimburg" and "E. Mach" Foundation