



Freie Universität Bozen
Libera Università di Bolzano
Università Lìedia de Bulsan

Faculty of Science and Technology

PhD programme in SUSTAINABLE ENERGY AND TECHNOLOGIES

Website:

<https://www.unibz.it/en/faculties/sciencetechnology/phd-sustainable-energy-technologies/>

Duration: 3 years

Academic year: 2017/2018

Start date: 01/11/2017

Official programme language: English

Programme contents

This is a full-time programme. The final thesis must be completed in English and must have a complete abstract in German and Italian. Therefore, PhD students should benefit from the special multilingual opportunities that the University offers, which include various activities/events in Italian, German or other languages (seminars, optional courses, social events, etc). The PhD 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 with which this University has an agreement or at other universities or research centres.

The PhD programme is based on the following milestones:

- students develop and organize their research plan 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 PhD Course Committee.
- students have to prepare, within 12 months of beginning of the programme, a public seminar in which they present and discuss the state-of-the-art of their research topic;
- 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 three months abroad conducting research;
- students must attend specific courses, e.g. for improving their English language, the analysis of literature and writing scientific articles, and on advanced statistics, as well as other courses or summer school courses approved by the PhD Course Committee, and pass the relevant exam.

In order to be admitted to the final exam, students must have written a scientific text where they figure as the main author and it has to be accepted for publication in an international peer-reviewed journal. Exceptions to this rule, if adequately motivated, will be evaluated and approved by the Academic Board, admitting to the evaluation also other peer-reviewed products with equivalent features.

Stages of the PhD

The research activities are spread over five stages that end after 2, 6, 12, 24 and 36 months. At the end of each stage, students have to meet the PhD Course Committee to present their project and results. The PhD Course Committee evaluates students' work and provides suggestions when necessary.

First stage (first 2 months): the PhD Course Committee meets the students and tells them who their supervisor is. Students then meet the supervisor to decide on their research topic regarding the areas listed in this advertisement. Students also work on a study plan that has to be approved by the PhD Course Committee. In the meantime, students will attend courses that are relevant to their individual study plan.

Second stage (2nd -6th month): students, after an exhaustive review of the literature concerning their subject area and the first steps in the research topic activity, must prepare their research programme that has to be approved by the PhD Course Committee. Students will possibly complete and/or follow courses that are relevant to their individual study plan.

Third stage (6th -12th month): students continue the research in their topic . They can also attend courses and summer schools. Students prepare their public seminar that will take place at the Free University of Bozen/Bolzano in which they discuss the state-of-the-art of their research topic. They will also present to the PhD Course Committee their research programme that they want to conduct abroad, possibly in the following year, and propose a co-supervisor at the foreign university or research centre for approval. They submit a report about the first-year activities to the PhD Course Committee.

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. In this stage or in the next, students are also expected to take part in an international conference to present the results of the activities developed inner the PhD studies and they should begin to prepare the manuscript(s) for publication in peer-reviewed journal(s). At the end of the year, the students present to the PhD 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 is(are) to be published and complete their (draft) thesis. To be admitted to the final exam, the students have to demonstrate to: (a) have acquired sufficient CFU as decided by the PhD council at the beginning of the cycle, (b) have at least one journal paper accepted where they figure as first author, and (c) have to present to the PhD Course Committee a report about the third-year activities and about their final thesis.

Research areas

Sustainable energy and buildings

Building Physics

This issue concerns the evaluation of energy performance of building components and the entire building system and the analysis, optimization and control of air conditioning and heating systems, both from a theoretical and experimental point of view.

The goal is to raise awareness within the area of the energy performance of buildings and to support and improve the sustainability of energy use in buildings, from the planning to the operational phase.

Renewable energy technologies

This issue concerns the theoretical and experimental characterization of the exploitation of renewable energy sources with particular attention on the processes of energy conversion of biomass, hydroelectric and wind. The purpose of the activity is to design and evaluate the technical-economic feasibility of different applications, on a per installation basis, and the evaluation of scenarios for a sustainable use in the Alpine region at the local level, considering also problems of hydrological forecasting on a short-term basis.

The efficiency and performance of electric and fluid machines, as well as the optimization of district heating systems will be also part of the research.

Energy and Environmental Design

This issue concerns the planning and design of the space around buildings and ecosystems on a regional scale, from small details of buildings to large-scale urban planning, from the history of the built-up environment to the design process.

The objective is to improve the sustainability of the human environment from the planning stage.

Sustainability in Industrial product and processes

Mechanical Design and Automation

This research area concerns the pursuit of sustainability, in particular by the design and development of new industrial products and technologies as well as the optimization of the existing ones, not only in the industrial but also in the agri-forest fields. The development of high-performance mechatronic systems as well as new methods for engineering design and experimental characterization will be part of the research.

The objective is to develop and/or improve the performance in terms of required resources, energy consumption, emissions and waste.

Manufacturing and Production Technology

This issue concerns the pursuit of sustainability of the production processes for the design of new products, in particular on new materials, i.e. metal alloys, also through the use of non-classical methods and technologies (e.g. Life Cycle Assessment (LCA), Smart Manufacturing).

These techniques will be also used for the design and development of new production and assembly processes in the industrial field.

Production and logistics management

This topic aims to study the practices, skills and techniques to plan, define, measure and improve processes, particularly for the industrial production and logistics context with the aim of meeting the upstream and downstream needs and obtain economic, social and environmental sustainability.

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 acquired an appropriate educational, and/or cultural background, and/or have worked in the PhD course fields.

Qualifications in engineering and architecture are preferable.

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

- CV and academic qualifications;
- their cover letter;
- interview.

Their level of English will be assessed during the interview.

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.
- Colour photo (passport size, 5:4, min. 290x230, max. 100 KB, jpg recommended).
- Photocopy of a valid means of identification.

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,
- any language certificates.

For those applicants with the pre-requisites only, the Evaluation Committee will first evaluate the CV, cover 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 knowledge of English will also 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 15 points for: the applicant's CV, cover letter and qualifications,
- up to 5 points for the appropriateness of the CV regarding the research areas of interest for the PhD program,
- up to 10 points for the interview.

The final score is the sum of the previous scores. The maximum score is 30. The lowest score to be admitted to the rank list is 15/30. The final score is used for the ranking of applicants and to establish access to the PhD Programme and who will receive grants.

Grants funded by external parties

For grants funded by external parties, the candidate, if interested in, must indicate in the personal statement letter his/her application. For these grants, separate rank lists could be drawn up.

These rankings will still consist of candidates placed first in the general rank list and will take into account the scientific background in the specific subject area.

If two of more applicants have the same score, 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) and at the notice boards of the Faculty of Science and Technology.

Examination dates

Description	Date	Place
Personal Interview	From 24 to 28 July 2017	Seminar room E5.20

Intake and grants

Total intake:	14
Intake with grants from the University:	13
Intake with no grant:	1