

Doctoral Studies in Computer Science and Computer Engineering at BTU Cottbus

1. Introduction

Brandenburg University of Technology Cottbus is a technical university which can issue doctoral certificates in natural sciences (Dr. rer. nat.) and in engineering (Dr.-Ing.). On top of that there are a few international programs of study which can give successful students a PhD degree. BTU also has limited capabilities to issue a Dr. phil. degree for doctoral students who work on history and philosophy of technologies. The faculty of mathematics, natural sciences and computer science can issue both Dr. rer. nat and Dr.-Ing. degrees. Students with a background in mathematics and physics and theoretical research in computer science will rather go for a Dr. rer. nat degree, while students with a background in computer engineering or electronics will rather go for a Dr.-Ing. The “PhD in dependable hardware / software systems” is devoted to researchers who somehow deal with aspects of HW/ SW systems design, test and dependability aspects.

Doctoral research at BTU (such as in German and Central European universities) is always done under the guidance of a professor. The content of research in doctoral education is always dominating and essential for the final success. There is no program of “doctoral studies” which just consists of lectures and labs with a tiny student project at the end.

2. Normal and structured doctoral programs of study

Traditionally, doctoral studies in computer science and computer engineering just consist of research without any mandatory lectures and associated examinations. This is also the case for students who get enrolled for a Dr.-Ing. or a Dr. rer. nat. Experience in Germany (and beyond) has shown that this type of education is the optimum, if the research experience gained at university can be used and continued directly after graduation. However, big companies with large industrial research departments are becoming a rare item in Europe. If candidates with a doctorate, who are typically older than masters and expect a better payment, want to be more attractive also for small and medium size companies, then they must have a scope of knowledge and experience well beyond the master level. In many cases, the research experience cannot be used by the company directly, and then a wider scope of knowledge and experience becomes essential for professional success.

Structured doctoral education which yields knowledge beyond individual research is relatively new in Germany. The level of such education must be clearly above the master level. Therefore BTU Cottbus has created a program of studies specifically for the technology of dependable embedded and distributed computer-based systems, which is composed in close cooperation with international partners such as Poznan University of Technology (Poland), Technical University of Liberec (Czech Republic) and Tallinn University of Technology (Estonia). The program consists of tutorials and workshops, which are organized also in collaboration with established research institutes such as Leibniz Institute for Innovative Microelectronics (IHP) of Frankfurt / Oder and the Fraunhofer Institute of Integrated Circuits (IIS / EAS) of Dresden. Tutorials are not only given by professors, but also by industrial researchers from companies such as Robert Bosch GmbH and Intel Mobile Communications.

Students who get enrolled for a Dr.-Ing. or Dr. rer. nat. degree are welcome to participate in such events. Their program of studies is not based on “credits” that must be obtained. On the contrary, the PhD in Dependable Systems is based on a scheme of credits. From a total of 180 Credits, 150 will come from individual research, 30 credits come from the educational program. These 30 credits are earned by the active participation in seminars and tutorials. The knowledge gained by tutorials may be assessed in seminars, but there is also a part of the final doctoral examination that will cover this broader range beyond the candidate’s individual research. A list of tutorials is published at the beginning of each year.

3. Internationalization

The educational program has been sponsored by the German Academic Exchange Service (DAAD) since 2008. Support will continue until 2016. It inevitably brings together doctoral students not only from the above partner universities, but also from “associate members” such as the University of Potsdam and Czech Technical University of Prague. Doctoral students are organized into topic-oriented research groups guided by one professor from the partner universities, who will meet about twice a year in workshops for exchange of problems, solutions and results. Doctoral students enrolled at one university may also spend research semesters at partner universities. Quite frequently professors from one university may finally become members of the doctoral graduation committee in a partner university.

4. Admission Process

There are strict regulations guiding the enrollment for doctoral studies at BTU Cottbus. Candidates must have a master level degree from a recognized university in a related area. They have to submit:

- The filled- in application form,
- certified copies of their bachelor and master certificates, if not in German or English, with certified translations,

- a CV,
- a summary of their master thesis,
- an outline of their research interest,
- recommendations from 2 previous professors.

These materials are checked formally by BTU's international department for compliance with regulations of admission to doctoral programs. For example, master degrees earned after 6 months of study without a master project will not be acceptable.

If the evaluation of the application is positive and there is a professor who has agreed to act as a supervisor, the Faculty Council will finally decide on admission.

Specifically for the "PhD in Dependable Systems", there is a PhD Committee, which checks the application beforehand and gives a recommendation to the Faculty Council. If a candidate wants to do his studies at BTU and one of the partner universities, then there is an international PhD Committee, which decides, if a candidate is suitable for this specific program of studies or not.

Candidates for BTU will also have to sign a declaration that they have not failed before in a topic-related doctoral thesis elsewhere.

Programs of structured doctoral education typically have a limited number of students.

5. Funding

Admission to doctoral studies at BTU Cottbus does not involve a grant. BTU Cottbus has founded "Cottbus International Graduate School" with several classes, where openings are advertised about every 3 years.

People working in BTU's research projects with regular payments may also get enrolled as doctoral students, if the employment is part-time.

Typically, professors at BTU select staff for their research projects only from well-known candidates, since they must deliver research results (design, software, publications) within a very narrow project schedule in most cases. They will sometimes recruit their co-workers from local PhD students.

External applicants may take a look at the web pages of DAAD, the German Academic Exchange Service for grants or inquire on: www.funding-guide.de