**Statutes of the Doctoral School of Mathematics and Scientific Computing**

*within the Framework of the Curriculum for the Doctoral Programme in Engineering Sciences at Graz University of Technology,*
*and the Curriculum for the Doctoral Programme in Natural Sciences at Graz University of Technology*

In accordance with the Universities Organisation and Studies Act 2002 (UG2002) and the study regulations of Graz University of Technology

November 8, 2016

**Preamble**

The Doctoral School *Mathematics and Scientific Computing* is a joint scientific project of the mathematical institutes at Graz University of Technology (TU Graz) and the Institute of Mathematics and Scientific Computing at Karl-Franzens-Universität Graz (KFU). It is based on:

- the guidelines of § 3 of the *Curriculum for the Doctoral Programme in Engineering Sciences* at TU Graz;
- the guidelines of § 3 of the *Curriculum for the Doctoral Programme in Natural Sciences* at TU Graz;
- and § 3 of the *Curriculum for the Doctoral Programme of Natural Sciences* at the Faculty of Natural Sciences at KFU.

These statutes regulate the joint supervision of doctoral candidates and describe the share of Graz University of Technology in this joint project. The doctoral school consists of mathematical institutes at  TU Graz, namely

- 5010 Institute of Analysis and Computational Number Theory (Math A),
- 5040 Institute of Numerical Mathematics (Math D),
- 5050 Institute of Discrete Mathematics
- 5060 Institute of Statistics,
- 5070 Institute of Geometry,

and of the mathematical institutes at KFU Graz, namely the

- Institute of Mathematics and Scientific Computing.

The cooperation within the framework of the doctoral school is intended to promote the joint supervision of dissertations at both universities as well as the associated scientific exchange. Extending the range of courses available to candidates with the modules offered at Karl-Franzens-Universität gives candidates the possibility to access a broader educational base. Students are strongly encouraged to make use of this opportunity.

The framework of the Doctoral School of Mathematics and Scientific Computing represents the following subject areas:

- Algebra and Number Theory
- Analysis
- Discrete Mathematics
- Numerical Mathematics and Scientific Computing
- Probability Theory and Statistics
- Geometry and Geometry Processing
- Optimization and Operations Research
- Differential Equations

The Doctoral School of Mathematics and Scientific Computing aspires to be a doctoral school with a strong international orientation. All modules are available in English if necessary. Graduates of this doctoral school at Graz University of Technology are awarded the degree of *Dr. techn.* or of *Dr. rer. nat.*

**Qualification Profile**

The Doctoral School of Mathematics offers scientific education at the very highest level, enabling graduates to undertake independent scientific research in mathematics and its applications. Graduates of this doctoral school are given the skills to independently implement the latest scientific results of mathematics and its areas of application.

**Statutes**

The following regulations refer to the respective sections of the *Curriculum of the Doctoral Programme in Engineering Sciences at Graz University of Technology,* and of the *Curriculum of the Doctoral Programme in Natural Sciences at Graz University of Technology*. Only those points of the curriculum which allow for or require a separate regulation to be issued by the doctoral school will be discussed.

**§ 3 Doctoral Schools**

(3) **Institutes**: At TU Graz, the doctoral school consists of the collection of mathematical institutes:

- 5010 Institute of Analysis and Computational Number Theory (Math A),
- 5040 Institute of Numerical Mathematics (Math D),
- 5050 Institute of Discrete Mathematics
- 5060 Institute of Statistics,
- 5070 Institute of Geometry.

**(3) Coordinating Team:** The Coordinating Team consists of a tripartite body (one professor, one mid-level faculty member, one student, plus one deputy for each of these).The members of the Coordinating Team are elected every other year by their respective bodies.

## § 5 PhD Thesis

**(2) Assessment of the thesis**: The members of the doctoral school with *venia docendi* according to § 3 section (3) are to be informed by email of the pre-selection of the referees. They are granted a period of one week (five working days) during which to make a response. Any negative responses are to be recorded.

**(6) Publication**: In these statutes, "organs of publication" shall mean journals and conference proceedings subject to the usual international peer review procedures and which are covered by *Mathematical Reviews*. As proof of publication, a confirmation of acceptance by the editor of the journal or an offprint is to be submitted. If publications are available, the referees' reports of the same are to be submitted along with the doctoral dissertation.

## § 6 Curricular Part (Classes):

The curricular workload in this doctoral school comprises 16 semester course hours and consists of the following modules:

(**2) Subject-specific Basic Modules "Grundthemen**" (basic topics, 2 × 3 semester course hours): The following advanced courses are to be held at postgraduate level (i.e., based on the relevant compulsory courses of the qualifying bachelor and master's or degree programmes). They should be broad in outlook and are not intended to provide a high level of specialisation. The lectures last three hours each. Involved institutes are to participate alternately in organising these lectures. According to requirements, two to four of these lectures are to be offered each academic year with the following titles:

- Basic Topics: Algebra
- Basic Topics: Analysis
- Basic Topics: Discrete Mathematics
- Basic Topics: Geometry
- Basic Topics: Numerical Mathematics
- Basic Topics: Optimization
- Basic Topics: Stochastics
- Basic Topics: Number Theory.

Each doctoral candidate has to obtain credits for at least two of these courses from different fields. Furthermore, on application to the Dean of Studies, basic subjects from other doctoral schools of Graz University of Technology can be chosen as long as this is warranted by the scientific orientation of the doctoral dissertation.

**Optional Subjects** (4 semester course hours): Lectures from the various master degree programmes in Mathematics that are deemed suitable for the doctoral programme in terms of scope and content are to be specified before the beginning of the academic year by the Coordinating Team in agreement with the heads of the institutes. Doctoral candidates are free to choose these lectures. Students may do their exam over these classes only after they have been admitted to the doctoral programme.

(**3**) **Scientific Methods and Communication** (4 semester course hours): In this category, the introductory seminar amounting to 2 semester course hours and two seminars for doctoral students, amounting to 1 semester course hour each, are compulsory.

(**4**) **Privatissimum** (2 semester course hours): Each supervisor holds one private tutorial (*privatissimum*) for his or her Ph.D. Students in which progress on the doctoral dissertation and current research trends in the broader scientific field are discussed.

### § 7 Defense of the thesis

(2) The date of the Ph.D. defense and the composition of the board of examiners are to be announced by email to all members of the doctoral school at least two weeks before the actual date. When setting a date for the defense, care must be taken to ensure that it can take place publicly in the setting of the doctoral school.

(3) The defense consists of two parts:

1. A 30-45-minute presentation by the doctoral candidate on his/ her scientific work. All members of the doctoral school are invited to attend this presentation. After the presentation, there will be an opportunity for the audience to ask questions.

2. An oral examination conducted by two examiners following the presentation, with 20-25 minutes allowed per examiner. The chair is entitled to ask questions. The examination part has the character of a defense of the doctoral dissertation with specialised questions regarding the doctoral dissertation and its wider scientific context.