Statutes of the Doctoral School of Biomedical Engineering at the Faculty of Computer Science and Biomedical Engineering at Graz University of Technology

Last updated: June 2020
(Please note: The English version of this document is a courtesy translation. Only the German version is legally binding.)

(1) Statutes of the Doctoral School of Biomedical Engineering

These Statutes were written by the Coordination Team of the Doctoral School of Biomedical Engineering. In addition to editing the Statutes, the Doctoral School Coordination Team is also responsible for considering detailed aspects related to the scientific discipline of Biomedical Engineering. This consideration is carried out in coordination with the officers responsible for study matters (Dean of Studies for the field of study Biomedical Engineering). The Doctoral School of Biomedical Engineering is composed of the staff members with the authority to teach at the designated institutes assigned to this Doctoral School, as well as the doctoral candidates assigned to this Doctoral School.

(2) Content characterization of the doctoral programme at the Doctoral School of Biomedical Engineering

The Doctoral Degree Programme at the Doctoral School of Biomedical Engineering (German title: *Doctoral School für Biomedical Engineering*) has been established to address scientific and technical problems in the field of biomedical engineering and closely related areas. The programme enables students to gain detailed knowledge in the aforementioned engineering and natural science fields, and not only in their own research work environment, but also in related fields. The training is carried out in parallel with research. Students who have been admitted according to §2(1) of the doctoral curriculum can be assigned to the Doctoral School of Biomedical Engineering regardless of their relevant previous degree programme, provided that the content of their doctoral degree programme can be assigned to the subject area of biomedical engineering.

(3) Academic degree to be awarded

Graduates of the Doctoral Programme at the Doctoral School of Biomedical Engineering who have been admitted to the Doctoral Programme in Technical Sciences will be awarded the academic degree of Doctor of Technical Sciences (abbreviated as “Dr. techn.”), and graduates who have been admitted to the Doctoral Programme in Natural Sciences will be awarded the academic degree of Doctor of Natural Sciences (abbreviated as “Dr. rer. nat.”).

(4) Training objectives and disciplinary qualification profile

The training programme has been designed to enable graduates to conduct independent scientific research, to gain an in-depth knowledge base in the fields of engineering and the natural sciences related to their research area as well as in related fields, and to provide them with high-quality skills in presenting and defending the results obtained.
Graduates of the Doctoral School of Biomedical Engineering possess qualifications including detailed knowledge in the subject area related to their dissertation work, extensive experience in applying scientific methods commonly used in engineering and the natural sciences, the ability to present and defend detailed results, and an aptitude for teamwork.
The graduate of this Doctoral School is qualified to independently apply state-of-the-art scientific findings from the engineering and natural sciences fields and to understand their areas of application.

(5) Subject areas of the Doctoral School of Biomedical Engineering

a) *Associated institutes of Graz University of Technology*
The following institutes are associated with the Doctoral School of Biomedical Engineering:
7090 Institute of Neural Engineering
7170 Institute of Medical Engineering
7180 Institute of Health Care Engineering with
European Testing Center of Medical Devices
7190 Institute of Biomechanics
7200 Institute of Biomedical Informatics

b) *Cooperation partner*
Inter-university collaborations as well as collaborations with research laboratories and the industries are welcomed. If a stay at an external research institution is planned, students are recommended to participate in the subject-specific advanced training seminars or doctoral seminars at this research institution. This participation is generally recognized as an alternative to participating in doctoral candidate seminars offered at the Doctoral School to a certain extent. Furthermore, the participation in lectures and exercises that are related to the dissertation work and that are not offered at TU Graz is also recognized.

(6) Composition and duties of the Coordination Team

The Doctoral School for Biomedical Engineering is managed by a coordination team with equal representation of professors, mid-level professors and doctoral students from the Department of Biomedical Engineering. The Coordination Team elects a spokesperson and a deputy spokesperson at the constituent meeting, which is held at the beginning of the three-year Senate period.
The duties of the Coordination Team include nominating mentors, pre-selecting reviewers, and coordinating the announcements made in the Doctoral School in cooperation with the Dean of Studies of the Biomedical Engineering field of study.

The doctoral candidates in the Doctoral School elect a spokesperson and a deputy spokesperson every two years. The spokesperson of the doctoral candidates has the right to be heard by the Coordination Team if irreconcilable differences of opinion arise between supervisors and doctoral candidates during the period of the dissertation, and in particular also with regard to supervision, mentoring, or the appointment of reviewers. If the dispute is resolved according to *Curriculum* §4(8) and at the request of the officers responsible for study matters (cf. §1 Statute Part on *Legal Regulations for Academic Affairs*), the Coordination Team will issue a statement.

(7) Guidelines for the supervision and mentoring of doctoral candidates in the Doctoral School of Biomedical Engineering

The supervision of the doctoral candidate is usually carried out by a university lecturer who is authorized at the institute to which the doctoral candidate has been assigned or currently belongs. Prior to beginning the dissertation work, the supervisor and the doctoral candidate agree to ensure that information is regularly exchanged in the form of progress reports on the part of the doctoral candidate.
The supervisor's task is to provide the doctoral candidates with support. This support can take several forms, including the provision of targeted and rapid feedback on the results presented, relevant contacts both within and outside the candidate's university and opportunities to present the interim results and findings.
The mentors should be selected from the Doctoral School environment and hold at least a doctoral or equivalent academic degree. The mentor does not need to be affiliated explicitly with the Doctoral School of Biomedical Engineering or TU Graz. The mentor should be nominated by the Coordination Team upon the recommendation of the doctoral candidate. In order to maintain confidentiality, both the mentor and the mentee must sign separate confidentiality agreements before the mentoring begins. Mentoring is offered specifically to provide the doctoral candidate with both informal and confidential support. The mentor should support the mentee throughout the duration of their doctoral studies to help them to advance in their studies and interact effectively with the supervisor.

(8) Guidelines for the assessment of the dissertation

At the latest eight weeks before the doctoral candidate submits the dissertation, they should submit a list of proposed reviewers, in consultation with their supervisor, to the Coordination Team of the Doctoral School of Biomedical Engineering. In accordance with the doctoral degree programme guidelines, the reviewers of a dissertation at the Doctoral School in question cannot work at the same institute as the candidate. The goal is to involve colleagues who demonstrate expertise in the subject from other universities as reviewers. The pre-selection of the reviewers, as described in the *Curriculum* §5(2), is carried out by the members of the Coordination Team of the Doctoral School. The pre-selection of the reviewers should take place at least two months before the dissertation is submitted. All reviewers should be familiarised with the preliminary version of the dissertation from this point and on. This gives the doctoral candidate enough time to consider and act on any suggestions for improvement.

(9) Rules for publishing at the Doctoral School of Biomedical Engineering

As a general rule, each doctoral candidate should be able to provide evidence that three publications on their research topic have been accepted or published in international peer-reviewed journals before they complete the doctoral programme. However, at least one publication with first authorship and another with co-authorship needs to have been published or accepted for

publication in a high-quality, subject-relevant journal. One of the co-authored publications can be replaced by the authorship of a relevant patent. The patent is considered as eligible in this context if it was submitted either by the university or by a company.
The dissertation must be written in English and can also be submitted as a cumulative collection of several publications with accompanying introductory and summary text (in German: *Manteldissertation)*. To submit such a dissertation, the candidate needs to provide evidence of at least three accepted peer-reviewed publications as first author or of two as first author and two as co-author in recognized, subject-relevant journals, whereby a substantial contribution from the candidate's dissertation needs to be demonstrated in the latter case. Again, one of the co-authored publications may be replaced by a patent. Guidelines for the evaluation of a co-authored paper can be found in the two publications [1] and [2]. If such a cumulative dissertation form is chosen, the candidate must clearly describe their scientific contributions to the publications in the introductory chapter.

(10) Scope of the curricular part of the doctoral programme

The curricular part of the doctoral programme at the Doctoral School of Biomedical Engineering comprises 14 semester hours.
The courses should include:
8 SWS of basic subjects in the discipline according to §6(2); 4 SWS of subjects in the area of "Scientific Methods and Communication" according to §6(3); and 2 SWS of research seminars (in German: *Privatissimum*) according to §6(4). The paragraphs named refer to the doctoral curriculum.

(11) Basic subjects in the discipline

Basic subjects in the discipline should be selected by the doctoral candidate from among the courses offered at TU Graz or other (domestic or international) universities in close consultation with their supervisor. The course plan is selected by the doctoral candidate in consultation with their supervisor and is approved by the Dean of Studies of the most relevant field of study.

These subjects should be as relevant as possible with respect to the dissertation work in order to provide the doctoral candidates with the optimal professional qualifications. Courses should preferentially be selected from §5a (elective subject catalogues) of the master's degree programme curricula for Biomedical Engineering, Mechanical Engineering, Telematics, etc. Courses that were completed at the end of a degree programme and that entitled the student to admission to this doctoral programme (e.g. master's degree programme) cannot be used as basic subjects in the discipline. In order to pursue a broad, higher-level basic education, the courses should not under any circumstances be taken only at the supervisor's institute. Examinations that have been taken at recognized domestic and foreign post-secondary educational institutions, colleges, universities, or non-university research institutions (e.g. summer schools or special courses) can be recognized by the officers responsible for study matters, if they are deemed equivalent.

(12) Subjects in the curricular area of "Scientific Methods and Communication"

Courses offered in curricular area of "Scientific Methods and Communication" provide the student with theoretical knowledge and – through practical application – the ability to obtain research results using scientific methods and to present and defend these results. The allotted 4 SWS

include the subjects “Scientific Colloquium for Doctoral Candidates” (2 SWS) and the “Doctoral Candidate Seminar” (2 SWS), which does not need to be taken in a specific semester. Both courses are held inter-institutionally together as a block. This course attendance is compulsory throughout the dissertation period. In the Doctoral School, each doctoral candidate has to present a paper on their dissertation at least once per semester until they graduate. Their attendance is confirmed by one the course instructors on an attendance sheet that is kept by the doctoral candidate. The certificate of attendance is issued by the supervising lecturer upon presentation of this confirmed attendance sheet.
The doctoral candidate seminar enables the progress and results of the doctoral projects that have been developed within the framework of the Doctoral School of Biomedical Engineering to be presented. Doctoral candidates present results base on the progress of their research work. All doctoral candidates in the first semester of their doctoral studies are required to present their work in the doctoral candidate seminar.

(13) Research seminar (Privatissimum)

The research seminar (in German: *Privatissimum*) ensures the personal supervision of a doctoral candidate and involves, for example, reading and reviewing submitted concepts, interim results, formulations, etc., as well as receiving specific feedback from the supervisor.

(14) Rules for composing the examination committee for oral examinations

The examination committee composed for the oral examination (*viva voce* or, in German: *Rigorosum*) must consist of at least three members. It usually consists of the Dean of Studies of the most relevant field of study as well as two persons assessing the dissertation. At least one member of the examination committee must come from outside TU Graz.

(15) Rules for conducting the oral examination

The original, signed expert assessments must be provided before the defence of the dissertation begins. If these assessments are not available, the dissertation defence cannot take place. The Dean's Office informs the external reviewers of this requirement. The assessments must contain the name of the candidate, the title of the dissertation, the assessment made and the justification for this assessment. The justification should address the new findings of the dissertation work with reference to the literature.
The date of the oral exam and the composition of the examination committee must be announced to all members of the Doctoral School by e-mail at least two weeks in advance of the defence. The oral exam dates should be communicated to all doctoral candidates assigned to the Doctoral School of Biomedical Engineering and to all institutes assigned to the Doctoral School. The oral exam is open to the public. As a general rule, it consists of a presentation made by the doctoral candidate (lasting approx. 30 min) on the research work carried out or the content of the dissertation, such as the scientific question addressed, the research methodology chosen, the main content and the most important results, as well as an oral examination.
The examination part has the character of a defence of the dissertation and involves specific questions about the dissertation work, whereby questions about the dissertation work and its presentation as well as questions that are closely related to this work are asked by the members of the examination committee.
Not only the members of the examination committee, but also all persons present at the discretion of the chairperson, are entitled to submit questions about the presentation part of the oral

examination.

(16) Confidentiality agreements for the members of the Doctoral School

The habilitated members of the Doctoral School as well as the student representative in the Coordination Team must sign a written confidentiality and privacy agreement. This promise to preserve confidentiality or privacy extends in particular to (i) reports and statements made by the doctoral candidate and the supervisor (*Curriculum* §4(4) and (6)), (ii) to all matters concerning the assessment of a dissertation (*Curriculum* §5(2)), as well as (iii) to the entire dissertation project or the dissertation itself, if the officers responsible for study matters have limited the publication of or blocked access to the dissertation (*Curriculum* §5(1) and (7)).

The dissertation must be published (§86, UG 2002). In the field of applied research, work performed by the doctoral candidate that is included in the dissertation is, in some cases, financed by industrial companies or other partners (e.g. universities, research laboratories). These partners usually have a vested interest in keeping confidential the results obtained as part of the research work and documented in the dissertation. In such cases, the Dean of Studies of the most relevant field of study can agree to block access to the dissertation for a limited period of time on the basis of a mutual agreement between the doctoral candidate, the supervisor and the partner(s). This step ensures that the results remain confidential so long as access to the dissertation is blocked. Despite this agreement, however, efforts must be made to publish the research results to an extent deemed acceptable to all partners in accordance with paragraph (9).

(17) Transitional provisions

These Statutes apply to students who follow the Curriculum for the Doctoral Programme in Technical Sciences or the Curriculum for Doctoral Studies in Natural Sciences (in both cases, the 2019 version), which entered into force on 1.10.2020. Ordinary students who started their doctoral degree programme in the technical sciences or in the natural sciences before 1.10.2020 and who have not agreed to follow the Curriculum for the Doctoral Programme in Technical Sciences or the Curriculum for the Doctoral Programme in Natural Sciences (2019 version) may still continue and complete their doctoral programme with reference to previously valid statutes up until 30.9.2024.

Bibliography

[1] A. Brand, L. Allen, M. Altman, M. Hlava and J. Scott (2015): Beyond authorship: attribution, contribution, collaboration, and credit. Learned Publishing, 28:151-155.

[2] L. Allen, A. O'Connell and V. Kiermer (2019): How can we ensure visibility and diversity in research contributions? How the Contributor Role Taxonomy (CRediT) is helping the shift from authorship to contributorship. Learned Publishing, 32:71-74.