

# Curriculum for Joint Doctoral Programme

## Geo-Engineering and Water Management

June 2009

### Introduction

This Curriculum for Joint Doctoral Programme (termed “JDP” for convenience) is arranged as a series of articles. The content of these articles covers the following: regulations and accreditation of postgraduate classes required to obtain a doctoral degree; policies and procedures related to postgraduate training; and, general information about the programme including submission and examination of the doctoral thesis. The postgraduate classes are organised in accordance with the European Credit Transfer and Accumulation System (ECTS).

The JDP presented in this document allows students from four Universities to obtain a doctoral degree in the area of Geo-Engineering and Water Management. The participating Universities and Faculties in this Joint Doctoral Programme (JDP) are:

**University of Maribor** Faculty of Civil Engineering

**University of Zagreb** Faculty of Civil Engineering

Faculty of Mining Geology and Petroleum Engineering

Faculty of Geotechnical Engineering (Varazdin)

**Budapest University of Technology and Economics** Faculty of Civil Engineering

**Graz University of Technology** Faculty of Civil Engineering Science

The full scope of this Joint Doctoral Programme (JDP) includes four parts:

1. Postgraduate classes (both at the parent University and in Joint Schools)
2. Research and preparation (writing) of doctoral thesis
3. Publication of the research in international journals

4. Doctoral examination

Lectures of the Joint Schools will be carried out by teaching staff at all the participating Universities. Lectures and exams will be conducted in English. It is also a requirement that the doctoral thesis should be submitted in English.

The Study Council consists of professors and doctoral students at all four Universities. The Study Council is responsible for the quality management of the JDP. The constitution of the Study Council is described in Article 3.

## Article 1

### Goal and Qualification Profile

(1) The aim of the Joint Doctoral Programme is, apart from the postgraduate classes and training, for doctoral students to acquire the ability to carry out independent, original and substantial research in an area of engineering science. Students who can demonstrate this objective are awarded a doctoral degree by their home University. The award title is specific to each partner University (see Table 1) and will be recognised by all partners as equivalent.

**Table 1** Title of award for each Institution

<b>Institution</b>	<b>Award title</b>
Budapest University of Technology and Economics	In English: Doctor (PhD) in Hungarian: Doktor (PhD) in Latin: doktoris philosophiae
University of Maribor	Doktor znanosti
University of Zagreb	Doktor znanosti
Graz University of Technology	Doktor der Technischen Wissenschaften (Dr. techn.)

(2) Qualification Profile:

A graduate of the JDP should have the following attributes: awareness of current and recent developments in the research area; ability to carry out independent and original research; quantitative and qualitative approach to problem-solving; formulate engineering and scientific hypotheses.

As the Joint Doctoral Programme has a strong international orientation, the graduate should be ideally prepared for international/global assignments.

The graduate should be capable of carrying out team work in the area of engineering science in both the university and industrial sectors, as well as being capable of

assuming a coordinating and leading function. The graduate should have a broad knowledge of the subject area as well as a detailed knowledge of the area of specialisation and should thus be able to apply this expertise to other applications.

- (3) The postgraduate doctoral studies are established and performed in the scientific area of technical sciences within the field of civil engineering and the field of mining, petroleum and geological engineering. They are part of the scientific branches of hydro-technical engineering, geotechnical, and environmental engineering with following major subjects:

Geo-Engineering and  
Water Management.

## **Article 2**

### **Admission, Workload and Length of Studies**

- (1) Admission to the Joint Doctoral Programme is preceded by admission to the ordinary doctoral programme in the relevant subject area at the candidate's home university according to the admission requirements of the latter.
- (2) Thereafter, admission to the JDP is authorised by the Study Council in accordance with the relevant authorities of the candidate's home university.
- (3) After admission to the JDP, the preceding admission to the ordinary doctoral programme is formally suspended. However, it is the candidates' right to return to the (original) ordinary doctoral programme, with recognition of the curricular achievements within the JDP.
- (4) Even after enrolling in the JDP, each candidate is subject to all regulations of the ordinary doctoral programme to which she/he was admitted in the first step; these regulations could be extended by the Curriculum of the JDP. Each participating

university is able to introduce/modify rules for transfer of students between the ordinary programme and JDP.

(5) The total workload for the doctoral candidate is subdivided as follows (for further details see Article 6):

a. 140 ECTS-credits for the doctoral thesis and publications. The doctoral thesis should be written in English.

b. 20 ECTS-credits or 14 "Semesterwochenstunden" (SWS)<sup>(1)</sup> from the lectures at the Joint Schools within the JDP, as specified in the Appendix<sup>(2)</sup>.

c. At least 20 ECTS-credits or 14 SWS from the home university of the doctoral candidate, according to the ordinary doctoral programme of this university. These regulations should be defined in an additional national document.

### **Article 3**

#### **Study Council**

(1) The Study Council consists of 16 members as defined in Article 3 (2): these include a chairperson, deputy chairperson and a coordinator for each of the four Universities.

The coordinator will act as a contact for the doctoral candidates at the respective university. These six positions are determined by an election of the Study Council.

(2) Each partner university nominates four members according to local requirements; one of them should be a student.

(3) All lectures of the Joint Schools (article 2 (5b)) have to be approved and shall be coordinated by the Study Council.

(4) The individual programme proposed by each doctoral candidate, in accordance with her/his doctoral supervisor, is only accepted after a positive assessment by the Study Council.

- (5) The Study Council is responsible for the quality control and evaluation of the lectures taking place.
- (6) Expert examiners for assessing the doctoral thesis and the final examination (rigorosum) are nominated by the Study Council according to article 5 (4). It is then necessary that the nomination is approved by the governing body of study law at the respective home institution of the doctoral candidate.
- (7) The Study Council coordinates the dissemination of relevant information within the Joint Doctoral Programme. This comprises of the following:
1. A short description of the doctoral thesis proposal (article 5 (1))
  2. Annual reports and comments (article 4 (5) and (6))
  3. Nomination of examiners (article 7 (2))
  4. Requests for embargo of a doctoral thesis (article 5 (7))

## **Article 4**

### **Rights and Duties of Doctoral Supervisors and Doctoral Candidates**

- (1) During the admissions process, the doctoral candidate should propose a doctoral supervisor. Within three months of admission, the candidate should define an educational agreement<sup>(3)</sup> in accordance with the doctoral supervisor; this is then signed by the doctoral candidate, the doctoral supervisor and the chairperson of the Study Council. The educational agreement contains a list of proposed subjects for which the doctoral candidate has enrolled, the order of examinations and the proposed timetable for submission of the doctoral thesis.
- (2) The doctoral supervisor confirms by signature that there is the necessary expertise to ensure that the subject of the proposal can be finished in the time provided. The doctoral candidate agrees by signature to abide by good scientific practice.

- (3) The doctoral candidate is obliged to attend the postgraduate studies classes defined in the educational agreement (Article 4(1)), to take examinations, participate in research work, and work towards submission of the thesis.
- (4) One of the tasks of the doctoral supervisor is to guide the doctoral candidate to work independently. This includes encouraging the candidate to consider publication in journals and conferences.
- (5) The doctoral candidate and the doctoral supervisor should have progress meetings at regular intervals. Either party can ask to meet in person. The doctoral candidate should submit a progress report each year to the doctoral supervisor. The doctoral supervisor should comment on this report. The report and comments are to be made available to the members of the Study Council. <sup>(4)</sup>
- (6) If the doctoral thesis is not submitted within five years of admission to the JDP, reasons should be given in the respective report and comments, according to Article 4(5).<sup>(5)</sup>
- (7) If there are extenuating circumstances, the doctoral supervisor is entitled to apply to the Study Council to resign as supervisor. An explanatory statement should be enclosed with this application.
- (8) In the case of irreconcilable conflict between the doctoral candidate and the doctoral supervisor, both parties are entitled to appeal to the Study Council as an arbitration board. A justified change of doctoral supervisor is possible up until the time of thesis submission.
- (9) There are other circumstances in which a change of doctoral supervisor is possible up until the time of thesis submission. The **prior** approval of the Study Council is required for this.

## Article 5

### Doctoral thesis

(1) A doctoral thesis should be submitted as part of the JDP which is to serve as proof of the doctoral candidate's ability as an independent researcher. For the admission process, the doctoral candidate should propose a working title for the doctoral thesis in consultation with the doctoral supervisor.

A short description of the doctoral thesis proposal is then submitted to the Study Council, and is then made public upon admission.<sup>(6)</sup> In exceptional cases, the public announcement, in terms of article 5 (7), can be limited to the members of the JDP who have teaching qualifications.

The doctoral thesis must be written in English, must be an original contribution to knowledge, and should conform to the following chapter structure: working hypothesis, relevant resume of situation referring to the research area, description of methods used in candidate's own research, description of candidate's research with the result presentation, the conclusion indicating an indisputable original scientific contribution, and a list of references used.

(2) In the doctoral thesis, the original contribution to knowledge should be presented and compared with the current state of knowledge. The work carried out should be completely documented, and the results presented in a clear and logical fashion. The structure of the doctoral thesis should follow the usual standards of the subject. For group work, the individual contribution of the doctoral candidate should be clearly stated; each doctoral candidate who has worked on the project should submit their own doctoral thesis.<sup>(7)</sup>

(3) Each candidate should be able to demonstrate at least two publications (related to his doctoral thesis) in international journals. At least one of the publications should be in a journal listed in the citation bases (CC/SCI or SCOPUS) and the other could be in a

journal listed in the bibliographic databases (Ei COMPENDEX, ICONDA, GeoBase or GeoRef). Other publications can be considered acceptable by the Study Council.

- (4) Assessment of the doctoral thesis is undertaken by three expert examiners who are nominated by the Study Council and should not be chosen from the home university of the doctoral candidate.<sup>(8)</sup> The doctoral supervisor and the doctoral candidate have the right to propose expert examiners. Members of the JDP are to be informed of the pre-selection of expert examiners by the Study Council. At least one of the examiners should be chosen from a university external to the JDP.
- (5) The pre-selection of the expert examiners should take place after input from the doctoral supervisor, at least two months before the doctoral thesis is submitted. All the expert examiners should familiarise themselves with the current version of the doctoral thesis at this point in time. After submission, the Study Council initiates the final assessment by the expert examiners. For the assessment, the doctoral thesis is marked according to the valid grading system.
- (6) Nine copies of the doctoral thesis should be made available on submission: three copies for the expert examiners, three copies for the home university of the doctoral candidate and one copy for each of the other three universities. The graphic design and binding should follow the guidelines of the respective university.
- (7) The doctoral thesis is to be made publicly available after the doctoral examination. Only in exceptional cases, can the doctoral candidate apply at the time of submission for an embargo of the doctoral thesis. This is handled according to the specific regulations of the home university. All members of the Joint Doctoral Programme should be made aware of any embargo.

## Article 6

### Curricular Part

- (1) Each student should agree the postgraduate classes of the JDP with their respective home university. In total, these classes should sum to 40 ECTS-credits (or 28 SWS), and consist of the following parts.
- (2) At least 20 ECTS-credits or 14 SWS have to be completed within the frame of a national doctoral programme at the home university of the doctoral candidate (Article 2 (5c)). Each participating University should specify postgraduate classes at an appropriately high level. These classes should broaden the doctoral candidates' knowledge of their own field and the specific topic of their doctoral thesis; and, bring the candidates up to date in research in related fields.
- (3) Another 20 ECTS-credits or 14 SWS have to be completed by the doctoral candidate during the Joint Schools (Article 2(2b)). Joint Schools will be held each year in February and July. The schedule of each Joint School will stipulate four weeks of lectures and half a week of exams. The organisation of the Joint Schools will be carried out by each University on a consecutive basis.
- (4) The achievement of students in examinations and other types of testing is marked according to the ECTS grading scale.
- (5) It is possible that some types of teaching activity can be carried out without marking. For example, it is possible that classes might be marked using description or by alternative means of assessment.
- (6) The respective classes for both curricular parts (paragraph 2 and 3) are combined into an examination subject. This is passed if **all** of the class examinations that count towards this examination subject have been successfully completed.<sup>(9)</sup>

## Article 7

### Doctoral Examination (Rigorosum)

- (1) The doctoral examination is the final part of the JDP. The date of the doctoral examination is arranged **only** after it has been proved that the courses have been completed according to Article 6 and positive assessments according to Article 5 have been presented in compliance with the respective guidelines. The doctoral examination should take place publicly before an examination board made up of the nominated expert examiners (Article 5 (4)).
- (2) The examination board is convened by the Study Council. It is composed of a chairperson and the three examiners. They are nominated by the Study Council and at least two should be chosen from outside the candidate's home university. The doctoral supervisor and the doctoral candidate have the right to propose the examiners.
- (3) The doctoral examination consists of two parts:
  - a. A presentation by the doctoral candidate of about 30 minutes summarising the work carried out and the main findings.
  - b. An oral examination on the subject area of the doctoral thesis by the examining board.

Minutes should be taken of the doctoral examination.

## **Article 8**

### **Final Assessment**

- (1) The overall assessment takes place after the doctoral examination has been completed, and is derived from three parts: the mark for the doctoral thesis, the performance in the doctoral examination and the marks for the postgraduate classes. The overall assessment is “pass” if all three marks are positive. It is “pass with distinction” if at least 50% of the total marks are assessed at grade A and none of the three marks are assessed lower than B.
  
- (2) After a successful doctoral examination, the doctoral candidate should deliver a final doctoral thesis version in both printed and electronic forms. The candidate should also attach the mandatory two publications according to Article 5(3).

## **Appendix: Explanatory Notes**

### **Article 2: Admission, Workload and Length of Studies**

- (1) *At TU Graz, credits within doctoral programmes are defined as “Semesterwochenstunden” (SWS). 1 SWS is equivalent to 15 hours of lectures.*
- (2) *In addition to the doctoral programme from the university the doctoral candidate is registered at, she/he will attend Joint Schools. The Joint Schools are organized by each University in turn. These Joint Schools will take place twice a year, in February and in July. Each Joint School will run for one month and will comprise of 4 weeks of courses and ½ week for exams.*

### **Article 4: Rights and Duties of Doctoral Supervisors and Doctoral Candidates**

- (3) *Detailed guidelines for the formulation of the educational agreement should be developed by the Study Council for the Joint Doctoral Programme.*
- (4) *The purpose of the report and comments is to monitor and evaluate progress made on the doctoral thesis topic as a means of assisting the doctoral candidate.*
- (5) *This regulation aims to have a mechanism at hand for the official examination of doctoral thesis that have not been successfully completed or left de facto unfinished. It is expressly stated that a doctoral thesis may take longer than five years to complete in certain cases (e.g. in connection with their profession) and with appropriate progress.*

### **Article 5: Doctoral thesis**

- (6) *In terms of quality control, the short description (1 - 2 pages) only aims to propose reasonable and realisable topics for the doctoral thesis. In addition, the short description makes it possible to critically observe the progress of the doctoral candidate. However, this should not mean that the doctoral thesis project cannot be added to or modified in the course of the work.*

- <sup>(7)</sup> *The regulations on the writing of the doctoral thesis are in the interest of good scientific practice. However, in connection with protecting interests for industrial doctoral theses, it should be ensured that the interests of the scientific community are preserved and guaranteed, and that the expert examiners are granted assess the doctoral thesis.*
- <sup>(8)</sup> *The appointment of expert examiners should follow good scientific practice. As a rule, the expert examiners should be international experts so that a well-founded, independent opinion is obtained. Besides expertise in the field, particular attention is to be paid to impartiality in selection of the expert examiners.*

**Article 6: Curricular Part**

- <sup>(9)</sup>*The purpose of combining the marks from the postgraduate classes is to prevent the individual marks from having too much influence on the final assessment (Article 8).*