



Vrije Universiteit Brussel

FACULTEIT INGENIEURSWETENSCHAPPEN

PhD in Engineering Sciences & PhD in Engineering Technology

Accompanying guidelines for the central and the supplementary faculty PhD regulations.

a. Procedure for the composition and approval of the examination commission (art. 31 of the central regulations)

For each PhD thesis, an examination commission that is proposed by the supervisor(s) should be approved by the Faculty Board. This commission must be approved at the latest three months before the submission of the PhD thesis. The commission is hereafter referred to as the doctoral jury. The proposal for the doctoral jury must be submitted at the faculty secretariat at the latest two weeks before the next meeting of the Faculty Board. If not, the approval of the doctoral jury will be postponed until the next meeting of the Faculty Board. It is the supervisor (not the PhD student) who is responsible for contacting all jury members while composing the doctoral jury.

The chairman of the Faculty Doctoral Committee (FDOC) is an ex officio member of each doctoral jury, except for the juries of the department/research group of which the chairman of the FDOC is a member. For the latter juries the vice-chairman of the FDOC takes over the role of the chairman of the FDOC. The chairman of the jury and the supervisor cannot both belong to the same department or officially recognized research group.

Furthermore, it is recommended that the composition of the doctoral jury shows a broad scientific expertise.

For an interdisciplinary PhD across different faculties and a joint PhD the jury exists of: a maximum of two VUB-IR supervisors and at least one jury member originating from the partner faculty or institution. The number of supervisors originating from the partner institution is not limited. The same rule applies for an interdisciplinary PhD across different faculties.

For PhDs that are in collaboration with recognized scientific institutions (Von Karman Institute (VKI), the Royal Institute for Cultural Heritage (in Dutch, het Koninklijk Instituut voor Kunstpatrimonium, KIK), IMEC, Royal Meteorological Institute (Koninklijk Meteorologisch Instituut, KMI), Belgian Nuclear Research Centre (in Dutch: Studiecentrum voor Kernenergie, SCK), Flemish Institute for Technological Research (in Dutch, Vlaams Instituut voor Technologisch Onderzoek, VITO), Royal Belgian Institute of Natural Sciences (in Dutch: Koninklijk Belgisch Instituut voor Natuurwetenschappen, KBIN), CERN, Fraunhofer Institute, MAX Planck Institute, Dutch organisation for

research in applied physics (in Dutch: Nederlandse organisatie voor Toegepast Natuurkundig Onderzoek, TNO),...), the jury is composed of at most 2 VUB promoters and possibly 1 promoter from the scientific institution who has effectively supervised the PhD according to the charter of the good promoter (to be verified case by case).

The decision of the Faculty Board concerning the composition of the doctoral jury will be communicated to the chairman within one week after the meeting of the Faculty Board. It is the responsibility of the chairman of the jury to make sure that the supervisor contacts the jury members, bearing in mind the organization of the private and the public defence.

Possible changes to the composition of the doctoral jury must be approved by the Faculty Board.

If several supervisors guide the PhD thesis, the ZAP-supervisor (see art. 19 of the central regulations) earns the right to vote.

b. Role of the chairman of the doctoral jury

Complementary to the central regulations:

- Upon receipt the chairman screens the PhD for plagiarism in TurnItIn and sends the report together with his findings to the vice-chairman and the secretary of the doctoral jury (see § f Procedure for detecting plagiarism for the details).
- The chairman explains the procedure of the defence (private/public) to the external jury members before the start of the private defence.
- The chairman introduces the different jury members to each other in the presence of the PhD student.
- Immediately after the evaluation of the private defence, the chairman orally informs the PhD student about the decision of the doctoral jury.
- The chairman makes sure that the secretary notes all remarks regarding the content of the PhD thesis and all suggestions/requests for additions and/or changes to the PhD thesis made during the private defence. The chairman ensures that these remarks are communicated in due time to the PhD student.
- It is the responsibility of the chairman to fix the final dates for the private and public defences.
- The chairman explains the procedure of the defence (private/public) to the audience at the start of the public defence.
- The chairman introduces the jury members to the audience and then leaves the floor to the PhD student to present his/her thesis.
- The chairman leads the scientific/technical discussion during the private as well as the public defence.
- When the jury members have no more questions, the audience has the right to question the PhD student.
- After the public presentation and the scientific discussion by the members of the jury and the audience, the doctoral jury retires to deliberate. The deliberation itself consists of two consultation rounds:
 - (i) First the chairman (or the vice-chairman) explains the criteria for the assessment of the PhD thesis, next he asks for the opinions of the jury members regarding the thesis in the following order: external jury members, internal jury members,

supervisor(s). In case a jury member is absent, the chairman reads the written advice that was given to the chairman by the absent jury member.

(ii) In the second round, the chairman asks the supervisor(s) to suggest a certain grade and asks for the opinions of the jury members regarding the proposed grade.

- The chairman of the FDOC is replaced by the vice-chairman of the FDOC for all doctoral juries where the PhD candidate belongs to the same department or research group of the chairman of the FDOC.

c. Role of the secretary to the chairman of the doctoral jury

- The secretary to the chairman sends the list of criteria for evaluating a PhD and assigning the grades to all external jury members.
- Under the supervision of the chairman, the secretary notes all remarks regarding the content of the PhD thesis (scientific/technical) and all suggestions/requests for additions and/or changes to the PhD thesis that are made by the jury during the private defence. These remarks are communicated in due time to the PhD student (typical within two working days). A copy must be sent to the chairman and the vice-chairman of the jury.
- Under the supervision of the chairman, the secretary communicates the date of the public defence to the faculty secretariat.
- Once the date, the hour and the location of the public defence are fixed, the secretary forwards this information to the external jury members.
- If applicable, the secretary collects the written advices and makes sure these are present at the day of the public defence.
- The secretary is responsible for providing the necessary documents (PhD book + proclamation sheet + deliberation sheet) at the day of the public defence.

d. Role of the supervisor of the PhD

Complementary to the profile of "a good supervisor":

- It is recommended that the promoter screens the PhD thesis for plagiarism in TurnItIn before sending the text to the members of the jury (see § f *Procedure for detecting plagiarism* for the details).
- It is the supervisor (not the PhD student) who is responsible for contacting all jury members while composing the doctoral jury.
- Under the supervision of the chairman, it is the supervisor (not the PhD student) who is responsible for selecting the dates of the private and public defences and for preparing the invitation of the jury members. The dates of the defences must be selected by mutual agreement with the PhD student and all jury members (see *Procedure for the assessment of the PhD thesis*).

e. Choice of the external jury members (art. 31 of the central regulations)

The external jury members are internationally recognized experts in the concerning PhD domain. They insure the independent quality control and contribute to the international visibility of the conducted PhD research, which is important for the department as well as for faculty and the VUB.

These external jury members can be listed as an expert (i) by the PhD student for post-doc applications and/or post-doc evaluations, for applications at research centres, etc.

...; and (ii) by the supervisor for FWO (Fonds voor Wetenschappelijk Onderzoek Vlaanderen), SRP, ..., project applications (where the experts are scientifically screened via the Web Of Science!).

Externals without PhD degree, but disposing of a strong academic record, can be accepted as a member in the doctoral jury under the following condition. A motivation letter must be submitted to the Faculty Board to prove the highly specific expertise of the potential jury member with regard to the PhD subject and its importance to the assessment of the PhD thesis.

Externals without PhD degree or a strong academic record, but who still dispose of a highly specific expertise on the PhD subject, can be enrichment for the technical/scientific discussion. At most one such an external can be accepted as jury member with advisory vote provided the following two conditions are fulfilled. (i) A motivation letter must be sent to the Faculty Board to prove the highly specific expertise of the potential jury member with regard to the PhD subject and its importance to the assessment of the PhD thesis. (ii) The doctoral jury contains two additional external jury members with a strong academic record.

In case of a PhD in Engineering Technology, the jury should include at least one jury member, with the exception of the supervisor, which has industrial or valorisation experience with regard to the PhD subject.

f. Procedure for detecting plagiarism

There are two types of plagiarism:

type I: parts of existing texts describing existing methods, algorithms or experimental setups are copied without correct referencing

type II: scientific results of others are presented as own original contributions (= fraud)

First of all the promoter is encouraged to screen the PhD thesis for plagiarism in TurnItIn before sending the text to the members of the jury.

The next steps in the plagiarism detection procedure are:

- Upon receipt the chairman screens the PhD thesis for plagiarism in TurnItIn and sends the report together with his findings to the vice-chairman and the secretary of the doctoral jury.
- In case of *type I* plagiarism the PhD student revises the PhD thesis (correct referencing, reformulation where needed).
- In case of *type II* plagiarism the chairman, the vice-chairman and the secretary of the doctoral committee decide upon acceptance/rejection and revision of the PhD thesis, after consulting the promoter, and after hearing the PhD student.
- In case the PhD thesis is rejected and the PhD student wants to appeal against this decision, the chairman of the doctoral jury sends the whole file to the fraud committee of the VUB.

g. Procedure for the assessment of the PhD thesis (art. 32, art. 33, art. 38–41 of the central regulations)

Under the supervision of the chairman of the doctoral jury, the supervisor selects the date of the private defence and prepares the invitation of the jury members. The date of the defence must be selected by mutual agreement with the PhD student and all jury members. The private defence should take place not less than one month and not later than three months after the submission of the PhD thesis.

The doctoral jury examines the PhD thesis and, based on the private defence, the jury takes a decision concerning the admission to the public defence. The private defence can be considered as an examination where the jury members question the PhD student about all aspects of the PhD thesis. It is recommended that the PhD student presents a short summary (min. 15 minutes, max. 30 minutes) of his/her thesis putting the emphasis on the important and original aspects. The length of the private defence is determined by the chairman but is usually between 2 and 3 hours.

Based on the private defence, it is possible that the doctoral jury decides that no suggestions/changes to the PhD thesis are necessary. In that case, the originally submitted version is the the final version of the PhD thesis.

A second possibility is that the doctoral jury decides that only a few minor changes to the PhD thesis are necessary. In that case, the PhD student can get the permission to publicly defend his/her thesis on the following condition. The PhD student needs to submit a revised PhD thesis to the faculty secretariat one week before the public defence at the latest. Within this period, the PhD student also informs the jury members about the changes that were carried out and provides them with a revised version of the PhD thesis.

A third possibility is that the doctoral jury decides that the PhD thesis must be changed to a large extent. In that case, the PhD student does not yet get the permission to defend in public. The PhD student needs to revise his/her PhD thesis and provide all jury members and the faculty secretariat with a revised version. After consulting all jury members (orally, in writing or by e-mail), the chairman decides if the modifications to the thesis are accepted. If so, then the PhD student can defend his/her PhD thesis in public and the chairman communicates this to the student.

Immediately after the evaluation at the private defence, the chairman orally informs the PhD student about the decision of the doctoral jury. Under the supervision of the chairman, the secretary sends within two working days (in writing or by e-mail) the remarks of the doctoral jury to the PhD student.

Once the PhD student is finally permitted to move on to the public defence (possibly after revising the PhD thesis), the supervisor selects a date for the public defence under the supervision of the chairman and by mutual agreement with all jury members. Under the supervision of the chairman, the secretary reports the date of the public defence to the faculty secretariat. A period of at least three weeks must be maintained between the announcement of this date and the date itself.

The public defence consists of a presentation of the PhD thesis that lasts about 45 minutes. The PhD candidate should prove his/her pedagogical skills: the presentation should be accessible for non-specialists in the field. After the presentation, the jury members ask (general) questions concerning the thesis and the future perspectives. Next, the audience gets the opportunity to ask questions to the PhD student concerning the content and the presentation of the PhD thesis.

The doctoral jury can only gather and deliberate in a legitimate way at the public defence if at least half of the jury members are present. Additionally, the supervisor and the chairman should always be present, except in case of circumstances beyond one's control. External jury members should attend at least one of the defences (private or public).

During the deliberation, the doctoral jury votes against or in favour, taking into account the written report(s) of the absent jury member(s) (a jury member that cannot participate in the deliberation for valid reasons) and the criteria for evaluating a PhD and assigning the grades (see Section g).

h. Criteria for evaluating a PhD and assigning the grades – all PhDs

1. The quality and the amount of the research performed should be sufficiently large.
2. The candidate should have an in depth understanding of the topic and, hence, answer well the questions asked by the members of the jury.
3. The candidate should have a critical attitude w.r.t. her/his own research results and those described in the literature.
4. The contribution of the PhD research should be clearly situated w.r.t. to the existing literature.
5. Good presentation at both the private (technical) and public (accessible for a broad audience) defence.
6. Well written PhD text.
7. Well written short summary in layman terms.
8. If applicable, the PhD text has been adequately revised according to the comments of the members of the jury, and a written and motivated reply to the comments and questions has been submitted, along with a detailed list of the changes made.

Publications in renowned international journals with peer review point towards the highest grade.

The assignment of the grade is based on criteria relating to the content of the PhD thesis, and is not based on percentage of grades assigned in the past.

i. Complementary criteria for a PhD in Engineering Technology

1. The output of the PhD research

It is likely that the research results of the PhD can be valorised economically or societally in a relative short period. The PhD has contributed, or has great potential to contribute to one or more of the following IOF-parameters of the university: patents, industrial contract research, spinoffs.

2. Insight and vision on the valorisation procedure

The PhD candidate has insight in the different steps necessary to valorise the results.

3. *Practical realisation*

The research results of the PhD have been realised in a proof-of-concept or a prototype.

4. *Strategic and economic importance of the research*

The research contribution has been situated w.r.t. industrial contract research, patents, and spinoff possibilities.

j. Complementary criteria for a PhD in Engineering Sciences: domain architecture

Criteria

1. New perspectives/insights.
2. Positioning w.r.t. other schools.
3. Development of a continuous thread (leitmotiv).
4. Logic of the descriptions.
5. Completeness of the sources (references).

Difficulty

1. Risks taken in the problem statement (classical research question or questions/problems that nobody dared to tackle)
2. Penetrating into another world of thought or culture (e.g., study of a Japanese architect: did the researcher master the Japanese culture and the Japanese way of thinking?)
3. Retrieval of the relevant sources (e.g., finding sources in archives, musea ... can be an achievement on its own).

k. Choice of the type of PhD type (PhD in Engineering Sciences or PhD in Engineering Technology)

Along with the first registration, the PhD student chooses the type of PhD in common agreement with his/her supervisor. If the supervisor agrees, the PhD student can switch PhD type during the course of his/her PhD.

l. PhDs in cooperation with industrial companies

It is clear that the industrial partner's interests (protecting the research results) are inconsistent with the interests of the researcher/university (publishing the research results). This confidentiality problem is present for each PhD in cooperation with an industrial company.

The interests of the industrial partner and the researcher/university can be reconciled by means of the following procedure:

1. The researcher describes the new result/idea and communicates this to the industrial partner. The industrial partner has a predefined period of time (e.g. 3 months) to decide whether he wants to protect the result/idea or not.
2. In case it is decided to protect the idea, a provisional patent is submitted by the inventor(s) and the industrial partner(s) (together with writing an article for example). The typical period of time to this end is 3 months. From the submission of the provisional patent on, the submitted paper cannot be used anymore as a prior-art against a final patent application. Proceeding in this

- way, the inventors have a period of one year to complete the final patent application.
3. The final patent application is submitted within one year after the submission of the provisional patent. The result/idea is protected from the submission until the approval/rejection of the patent. In case of approval (which can take years), the patent offers a protection for 20 years.

This procedure shows that, provided good agreements (stipulated in a contract before the start of the PhD research) and following a strict time schedule, the results can be published and protected at the same time. Hence, it is clear that collaboration with an industrial company within the framework of PhD research does not imply a lack of publications at the end of the PhD.

m. Guidelines concerning the layout of the PhD thesis

The PhD student will give a written copy of his/her PhD thesis to the Faculty secretariat and to each jury member.

For the cover page of the PhD thesis, it is preferred that the PhD student uses the template from the Faculty of Engineering Sciences (see attachment). Only the logo of the VUB is printed on the front cover of the PhD thesis. In case of a joint PhD, the logo of the partner institution can also be printed on the front cover. Logos of other partners are only allowed on one of the inner pages of the thesis. The summary of the PhD thesis is printed on the back cover. Objective: a summary that is meant for a broad audience with extra attention to the social context and relevant applications. Assessment: during the private defence. This summary is added to the list of criteria for the assessment of the PhD.

The composition of the doctoral jury is mentioned on the first inner page. It is recommended that the PhD thesis is delivered in the commonly used format 17 cm x 24 cm.

The written summary must be submitted together with the temporary version of the PhD thesis. This summary is mentioned on the back cover of the PhD thesis.

n. Publications of the PhD results

If the supervisor agrees, it is allowed to publish parts of the PhD thesis during the research period. The supervisor can publish research results if the PhD student agrees. Patents are also considered as publications.

o. Disputes (art. 25 of the central regulations)

Should a dispute arise during the preparation of the PhD thesis between the supervisor(s) and the PhD student, the following action will be taken. The Dean, the chairman of the FDOC and the Ombudsperson for PhD students will intervene to mediate. In case the dispute concerns a PhD student whose supervisor is the chairman of the FDOC, the vice-chairman of the FDOC intervenes to mediate.

p. Joint PhD with RMA (Royal Military Academy), a domestic and an international institution (art. 31 & art. 41 of the central regulations)

The conditions that are mentioned in the partnership between the VUB and the RMA concerning the organisation of joint PhDs or in the framework of a joint PhD between the VUB and a domestic or an international institution can never be in conflict with the central regulations concerning the conferring of the academic PhD degree.

An ad-hoc 'Contract establishing a joint PhD', which includes specific administrative and pedagogical terms, is formulated for each joint PhD with the RMA or with a domestic or an international institution. For example, this convention includes whether the student will receive a joint diploma or a double diploma.

In case of a joint PhD with the RMA or a domestic institution, the private and public defence can take place on the premises of the partner institution as stipulated beforehand in the ad-hoc 'Contract establishing a joint PhD'.

In case of a joint PhD with an international institution, the public defence can take place abroad, on the premises of the partner institution, as stipulated beforehand in the ad-hoc 'Contract establishing a joint PhD' beforehand. The private defence, however, takes place on the premises of the VUB. When concluding the private defence, the doctoral jury already proposes a grade for the PhD degree.

The doctoral jury should at least contain 2 members of the partner institution (the promoters count for one), 2 VUB members (the promoters count for one), and 2 external examiners (non-VUB and non-partner institution).

If the public defence of a joint PhD takes place abroad, at least two jury members from the VUB should be present; one of which is the supervisor of the PhD. The second jury member is designated by the Faculty Board. If, during the deliberation at the public defence, the jury proposes a grade that deviates from the original grade that was proposed at the private defence, the assignment of the grade is as follows. The VUB-supervisor and the additional ZAP-member are granted delegation to vote on the final grade on behalf of the VUB-jury members of the doctoral jury. This voting is done together with the members of the partner institution/university and the external jury members.

q. Procedure of the standing guidance committee – approval of the specific guidance committees (art. 20 of the central regulations)

The standing guidance committee handles all non-domain specific guidance problems (e.g. publication strategy, which authors on a paper, patents versus papers, drafting of a co-tutelle contract, when to include somebody as a co-promoter, ...). In case domain-specific guidance problems are submitted to the standing guidance committee, it reserves the right to set up a specific guidance committee, and this in common agreement with the promoter(s) and the PhD student. The proposal is submitted to the FDOC for approval.

The FDOC obtained on the 18th of February 2016 delegation from the Faculty Council to approve the specific guidance committees.