



NTNU – Trondheim
Norwegian University of
Science and Technology

Quality in PhD education

Common Standard and Handbook



NTNU – Trondheim
Norwegian University of
Science and Technology



Photo: Geir Mogen

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Quality in PhD education

NTNU's vision is "Knowledge for a better world", and our objective is to be internationally out-standing. To achieve this goal, we must recruit talented candidates and offer doctoral education of high quality and relevance.

In 2009, NTNU conducted a broad-based survey of its doctoral education as a foundation for further development and strengthening of the programmes. The survey showed that many aspects were good - but there was room for improvement. The dropout rate is higher than we would like. Some of our candidates take longer than the nominal period of study, and should have better follow-up during their work. As a result of participation from all parts of the university, we are now working on improving PhD education in several ways.

One result of this initiative is the booklet you are now reading. It is intended to help achieve even better PhD education at NTNU. The booklet has two parts. The first is the "Common Standard of Quality for PhD education at NTNU". The second part is a "Handbook for PhD education at NTNU", which describes measures to promote quality at all stages of the programme, with examples of best practice. These are intended as a means to achieve the best possible PhD process, from recruitment and admission to submission and disputation. One of the aims is to establish a common standard for our PhD education. A second is to provide examples of best practice. A third aim is to make it clear which level of the organization is responsible for initiatives and procedures.

Doctoral education is one of the university's most important responsibilities, and we have high ambitions for PhD education at NTNU.

NTNU – 26 September – 2011



Torbjørn Digernes
Rector



Kari Melby
Prorector Research

Common Standard of Quality for PhD education at NTNU

The Common Standard of Quality for PhD education is to apply to all PhD education at NTNU. The Common Standard specifies a common minimum standard. It describes best practice for the whole PhD progression from recruitment to disputation and indicates which level of the organization is responsible for launching initiatives. At NTNU, responsibility for the PhD programmes is delegated to the respective faculties.

PhD education is governed by the Regulations and the Agreement, and the Common Standard is supplementary to these. The objective of the Common Standard and Handbook is to reduce withdrawal from the programme as well as to contribute to high quality and completion within the nominal period of study.

The PhD candidate's most important responsibility is to conduct high-quality research and be a contributor to the academic environment through active participation. The scope of the Common Standard does not include initiatives related to academic quality in the respective disciplines.

RECRUITMENT

Goal: We aim to recruit the best candidates with the best projects to PhD positions at NTNU.

Central administration:

- Ensure that information about PhD education is readily available in Norwegian and English on NTNU's website, with links to the faculties' PhD programmes.

Faculty:

- Ensure that information about the faculty's PhD programmes is readily available on the faculty website.
- As a standard arrangement, announce PhD positions openly and advertise them actively among relevant national and international groups.
- Must have good procedures for advertising PhD positions, processing applications, and providing information to applicants.
- Must ensure that the requirements for formal qualifications for PhD positions are fulfilled.
- Must establish procedures to determine the suitability and motivation of applicants before a PhD position is offered.

Department:

- Must make active efforts to recruit good applicants for PhD positions.
- Must consider the competence, quality, and capacity of the academic environment and the proposed supervisor(s) to accept new PhD candidates and support their progress within the nominal period of study.

ADMISSION AND START-UP

Goal: Our PhD candidates will receive the best possible start and thus lay the foundation for a successful PhD progression.

Faculty:

- Must have effective procedures for ensuring quality in admissions to the PhD programme and in the appointment of supervisors.
- Must ensure that the organized academic training is of high quality.
- Must ensure that an introductory seminar is held for all new PhD candidates.
- Must ensure that the PhD candidate's work is evaluated before the trial period ends.

Department:

- Must take steps to offer candidates an attractive and inclusive environment, both academically and socially.
- Must consider offering all PhD candidates a mentor.
- Must offer all new PhD candidates a "Welcome" talk.
- Must evaluate the PhD candidate's work before the end of the trial period and decide whether employment in the position should be continued.

Supervisor:

- Is responsible for possessing skills in supervision and for developing these skills.
- Must introduce the candidate to relevant academic groups at the university as well as at national and international levels.
- Must ensure that necessary permission is obtained for use of research data and that the obligations related to use of the data are fulfilled.

IMPLEMENTATION

Goal: PhD candidates employed at NTNU and external PhD candidates in our programmes must be offered good academic and social working conditions enabling them to work satisfactorily and complete their PhD within the nominal period of study.

Faculty:

- Must have good procedures for reporting of finances, leave of absence, absence due to illness, etc.
- Must have effective procedures for checking progress against the planned schedule. Reporting must take place at least once a year, with an evaluation in greater depth during the PhD period.
- Must establish procedures for recording non-conformances and matters of concern, and must take necessary measures in cooperation with the department / supervisor.
- Has overall responsibility for internationalization of the PhD programme.
- Must take steps to support further development of supervisors' skills.
- If the candidate voluntarily takes the initiative to withdraw from the PhD programme, the faculty must determine the cause and discuss the situation with the candidate in order to prevent dropout.

Department:

- Is responsible for offering candidates good working conditions in an attractive and inclusive environment, both academically and socially.
- Must ensure that any required duties comply with the regulations in force and that they are organized in such a way that they do not impede completion within the nominal period of study.
- Must conduct performance assessment interviews with all PhD candidates.
- Must have procedures for receiving and dealing with expressions of concern and must take necessary measures in cooperation with the faculty.

Supervisor:

- The main supervisor has the primary academic responsibility and must remain informed about progress.
- The main supervisor is responsible for reporting any non-conformances and matters of concern.
- The main supervisor is responsible for coordinating supervision.
- Supervisors must help to ensure that the candidate is integrated in the academic environment and is kept informed about the latest research.
- Supervisors are to help the candidate to establish contacts with relevant national and international environments and with internationalization of PhD education.
- Supervisors must help to ensure that the candidate publishes his/her work in channels of high quality.

COMPLETION AND SUBMISSION OF THESIS

Goal: PhD theses submitted at NTNU must meet high international standards and must be suitable for publication as part of the academic literature in the discipline.

Faculty:

- Is responsible for ensuring that assessment and disputation take place within the stipulated time limits.

Department:

- Must propose the assessment committee, invite the members, and help to ensure that the assessment and disputation can take place within the stipulated time limits.

Supervisor:

- Is responsible for considering whether the thesis meets the quality requirements before it is submitted.

Handbook for PhD education at NTNU

Introduction

This handbook is intended for anyone who works with PhD education at NTNU.

The aim is to achieve the best possible implementation of the doctoral programme. The handbook presents a standard; it describes measures to promote quality and clarifies the functions and responsibilities of the faculty, the department, the supervisor and the individual PhD candidate. The handbook provides a number of examples of best practice. Responsibility for the PhD programmes is dedicated to the respective faculties, and management of the individual programme is often delegated to a programme coordinator, who may be the head of department. The handbook specifies the responsible level in the organization. This is not necessarily identical to the executive level.

The handbook follows the phases of the pathway towards a PhD degree from recruitment and admission to completion and disputation. All the stages require attention to ensure the best possible education. Careful attention to the selection of PhD candidates, supervisors, and projects is necessary to lay the groundwork for successful completion. To strengthen supervision, the use of two supervisors will be established as a standard arrangement, but further development of supervisors' skills is also important. Doctoral candidates must be followed up throughout the programme through measures including the use of annual progress reports and a more thorough midway assessment. It is important that all candidates are well integrated academically and socially. The responsibility to provide and receive expressions of concern is to be made clear, which is a prerequisite for implementing any additional measures. The aim is to harmonize practice at NTNU, but this must be balanced against the traditions in different disciplines.

The main responsibility of the PhD candidate is to conduct high-quality research. This requires active participation in the academic environment. The most important component of a PhD degree is the research project and the PhD thesis, and the academic environment and supervision must ensure the quality of these. Further development of the organized academic training in the PhD programmes will be achieved through the faculties' implementation of the framework for third-level qualifications.

The handbook complies with national and local legislation and regulations: Regulations for the PhD degree at NTNU ("the Regulations"), Agreement concerning Admission to Organized Doctoral Degree Programme at NTNU ("the Agreement"), and the allocation of responsibility that is established in the institution. Relevant links are provided at the back of the handbook.

Siv Gøril Brandtzæg is a PhD candidate at the Department of Scandinavian Studies and Comparative Literature. She participated in the Researcher Grand Prix 2011, where she presented her PhD project on the popular novel in the 18th century.



Recruitment

The competition for talented researchers is increasing nationally and internationally. We must show that PhD education at NTNU is of high quality, and ensure that the candidates who are admitted to our PhD programmes are qualified to complete the degree and perform high-quality academic work.

Information in Norwegian and English about PhD education must be easily accessible at NTNU's website. Information of a general nature should include links to the faculties' description of their PhD programmes with contact persons. Vacant PhD positions are to be advertised with good visibility for internal and external applicants.

Faculty

The faculties are responsible for providing good and easily accessible information about the PhD programmes on their websites. How each programme is included in academic areas of focus and the opportunities that the programme provides should be made clear. Vacant PhD positions are to be advertised in a clearly visible way, and announcements are to be distributed actively to relevant environments nationally and internationally. Active recruitment of high-quality PhD candidates is to take place among the academic groups. It is important to motivate and encourage suitable master's degree students to enter a PhD programme.

All PhD positions must normally be advertised. The faculties are responsible for ensuring that the appointment process for PhD positions promotes the qualitatively best projects and PhD candidates. The faculties must have clear routines for processing of applications. It is especially important to ensure that the requirements for formal qualifications are met, particularly with regard to applicants whose first degree is from a country outside Norway. The applicants' right to information about the process and result must be respected. Applications must be evaluated in terms of a set of defined criteria including requirements for quality and consideration of academic priorities. A recommendation with reasons must be prepared. An interview is normally conducted to determine motivation and suitability before appointment to a PhD position.

Department

The departments must assess the skills, capacity, and past results of the academic group and the proposed supervisor in relation to accepting new PhD candidates and contributing to completion within the nominal period of study. The departments are responsible for determining whether the requirement that all supervisors are active researchers has been met.

Supervisor

Good contact between the PhD candidate and the supervisor is a prerequisite for the successful completion of the education. Prospective supervisors should establish contact with applicants for PhD positions during the application process, and assess the project's feasibility as well as the candidate's suitability and motivation for the education. The proposed supervisor should participate in the interview with the applicant for the PhD position.

PhD candidate

Prospective applicants for the PhD programme are responsible for obtaining information about what a PhD programme involves, and for contacting potential supervisors and academic groups.

Admission and start-up

NTNU's PhD candidates have diverse backgrounds. Some are recruited directly from our own master's programme; others come from other universities and university colleges in Norway and abroad, or from working life. Many are employed in PhD positions at NTNU. Others are PhD candidates in our programmes, but employed outside NTNU. We must pave the way for a good start to PhD research for everyone.

The start-up phase should provide a solid foundation for the PhD candidate's work, well-being, and sense of belonging to NTNU. It is important that all PhD candidates, both internal and external employees, are introduced to the academic community, and that a good working relationship is established between the supervisor and the candidate. This relationship is a key to a rewarding PhD experience; it should be characterized by mutual respect and active participation by both parties. The parties must draw up a plan for implementation and allocate responsibilities.

Faculty

The faculties are responsible for quality assurance of admission to the PhD programme and for appointing supervisors. The faculty must evaluate the candidate, project, academic group and supervisors. Decisions on admission are to be based on assessment from the department and head of the PhD programme (this may be the head of department). It is particularly important to assess the feasibility of the project, the qualifications of the PhD candidate, and the supervisors' competence (see the recommended national guidelines and NTNU's Regulations under Section 4 in the list of links at the end of the brochure).

BEST PRACTICE

PHD CANDIDATES EMPLOYED AT OR OUTSIDE THE UNIVERSITY

All PhD candidates who are admitted to NTNU's programmes are to be included in the academic community with regard to their discipline, regardless of their employment situation.

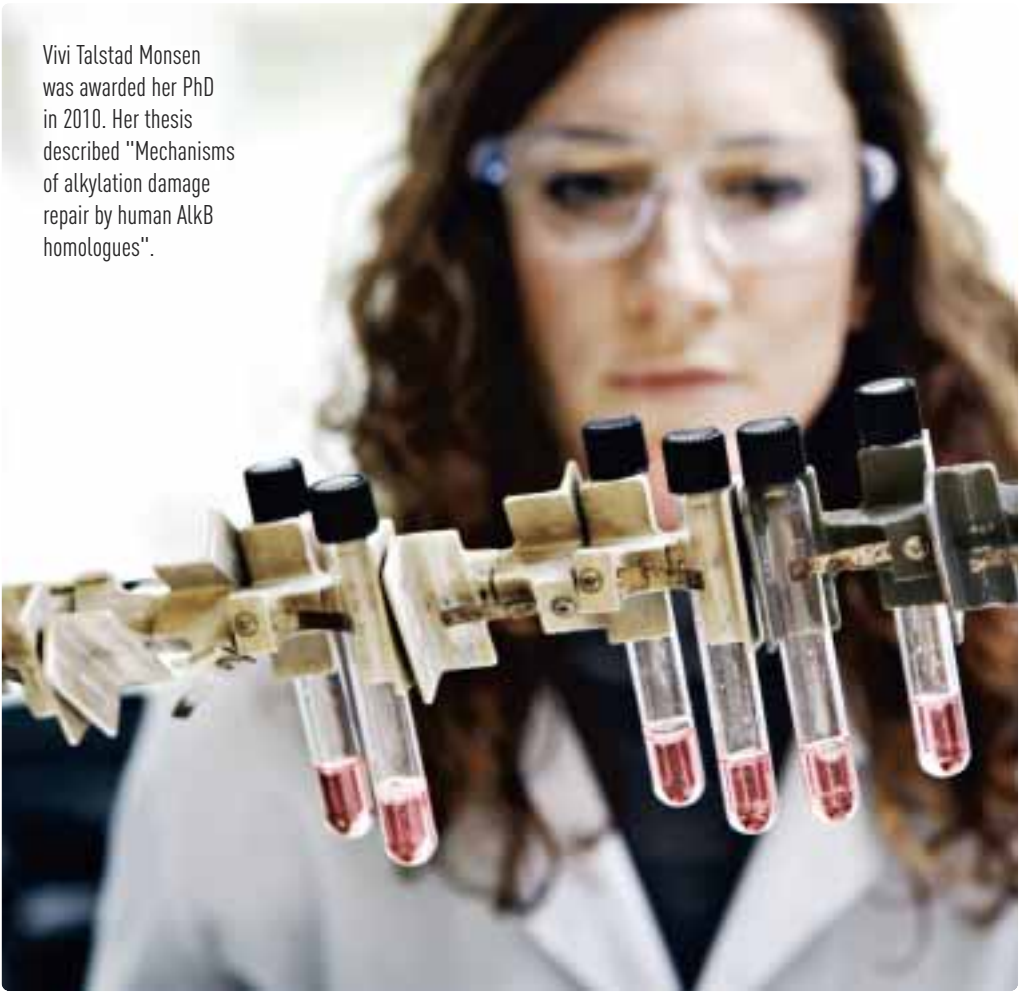
NTNU's PhD candidates may be employed at or outside the university. Employer responsibility involves formal responsibility for pay, leave of absence, office space, etc. In some cases, NTNU offers office space to externally funded PhD candidates. Some PhD candidates with funding from NTNU have their work location in other academic communities. Externally employed PhD candidates should be welcomed in the same way as candidates employed at NTNU.

The department is responsible for ensuring that all new PhD candidates (internal and external) have access to the facilities needed in their discipline as well as technical facilities. All PhD candidates associated with one of our PhD programmes are entitled to have a supervisor, and are to be included in relevant networks. Everyone in the work environment has a collegial responsibility for the well-being and inclusion of others.

The faculties should hold introductory seminars for new candidates 1-2 times a year, either for the faculty as a whole or for each programme.

The faculty is responsible for the organized academic training and for ensuring that PhD candidates are offered courses of high quality and relevance. The faculty must make arrangements for the candidate to take parts of the training at other institutions if there are academic grounds for this. The faculty is to approve the organized academic training on the supervisor's recommendation. The faculty is also responsible for providing training in research ethics, for courses in academic writing, and the like.

For NTNU-funded candidates, the faculty is responsible for evaluating the trial period and, if applicable, for continuing the appointment on the basis of a report from a meeting involving the candidate, the supervisor, the head of department, and the PhD programme coordinator (see links in Section 2 of the list of link at the end of the brochure).



Vivi Talstad Monsen was awarded her PhD in 2010. Her thesis described "Mechanisms of alkylation damage repair by human AlkB homologues".

Photo: Geir Mogen/Faculty of Medicine

INTRODUCTORY SEMINAR WITH INFORMATION PACKAGE

It is important to provide good practical and academic information early in the PhD process. Information must be offered at several levels, orally and in writing. In an introductory seminar, the new PhD candidates can be welcomed to the faculty and can receive information about:

- DION, the interest group for doctoral candidates
- the rights and obligations of PhD candidates
- the experience of PhD candidates whose work is in progress
- the PhD process up to submission of the thesis
- ethics in research and publication
- publishing strategies and review processes
- regulations and procedures (human resources) as well as health, safety and the environment (HSE)
- search in library databases, courses in teaching, writing courses, etc.

The introductory seminar should be held once or twice a year. Supervisors should participate in the seminar. At the introductory seminar, all PhD candidates can be given a folder with written information about topics including:

- workplace
- access to libraries
- access to good ICT solutions
- access to laboratories (if applicable)
- help with practical matters (materials, work permits, visas, etc.)
- housing in transitional period
- mentor
- literature

Department

The department plays an important role. This is the environment to which PhD candidates should feel they belong during their work with their doctoral degree. For candidates employed by NTNU, the department has employer responsibility. Externally funded PhD candidates usually reside in the university for a period, often totalling one year (residency requirement). It will usually be at the department that PhD candidates have office space, receive feedback on their work, and learn good research practice.

The department should consider offering a mentor to all new PhD candidates appointed at NTNU (and externally funded PhD candidates in residency periods). The mentor is responsible for introducing the candidate to the social environment and contributing to inclusion of the candidate at an early stage of the PhD programme. The mentor's role can be filled by a variety of people who know the academic community well: a PhD candidate colleague with experience, a supervisor, a PhD responsible, or other permanent employee. The most important contacts in the initial phase are

the head of department (formal employer responsibility), the (main) supervisor (academic skills and networks) and the mentor, if applicable (who knows central staff and established procedures in the department).

The department should offer the PhD candidate a "Welcome" talk, information about procedures and supplies, and an introduction to central staff (for example, the mentor, HSE representative, safety representative, and laboratory manager). It is also the department's responsibility to provide information and make agreements concerning safety courses, fire protection, and required duties where applicable (see NTNU's Regulations for required duties under Section 4 of the list of links at the end of the brochure).

THE "WELCOME" TALK

The head of department has the formal employer responsibility for PhD candidates employed by NTNU, but many of the tasks can be delegated to other people in the department. However, we recommend that the head of department invites PhD candidates for a "Welcome" talk. This will make the formal employer relationship clear.

The department must ensure that an agreement is signed by the head of department, supervisors, faculty, the PhD candidate and any external parties (see the form for the PhD agreement under Section 4 of the list of links at the end of the brochure). The department must also ensure compliance with obligations related to the use of research data by seeing to it that the PhD candidate, supervisor, and head of department, as well as any external parties, submit a signed list of necessary authorizations for the use of research data.

Before the trial period of six months expires, the department must decide whether the appointment of a PhD candidate employed by the university is to be continued. The basis for the decision is to be a written report on the project with a plan for completion and progress, and a meeting involving the PhD candidate, the supervisor, and if applicable the leadership of the PhD programme.

Supervisor

The main supervisor must follow up the candidate particularly closely in the initial phase to help ensure a good start for the PhD work. It is especially important to define the content of the project in detail, to define the required scope, and to agree on milestones. The supervisor assists in preparing the revised project plan, composing the training component, drawing up a plan for internationalization and preparing an application for admission.

Supervisors are responsible for assessing their own supervisory competence and supervision capacity, and for further development of their skills. Each PhD candidate is to have at least two supervisors, where the main supervisor represents a minimum of 50 per cent of the supervisory resources. Allocation of responsibility between the supervisors should be agreed explicitly and as early as possible. The main supervisor organizes a joint meeting with the candidate and the other supervisors as early as possible after start-up. It is strongly recommended that one of the supervisors has previously supervised PhD candidates.

The supervisors are responsible for introducing the PhD candidate to relevant academic groups both inside and outside the university as well as internationally.

PhD candidate

The PhD candidate prepares a project proposal and plan in consultation with the supervisor, attends introductory seminars, prepares an application for admission within three months of appointment and participates in completing the agreement concerning admission (see the recommended national guidelines and NTNU's regulations under Section 4 of the list of links at the end of the brochure).

DION

DION is the interest group for doctoral candidates at NTNU. DION works locally with individual cases as well as with general issues. DION also cooperates at national level with other PhD candidate organizations through the association of doctoral organizations in Norway (Stipendiatororganisasjonene i Norge, SiN).

Visit DION at: <http://www.dion.ntnu.no/>



PhD graduate Frantz Stabo-Eeg is working with optics in the research laboratories in physics.

Photo: Gorm Kallestad, Scanpix/NTNU Info



The Researcher Grand Prix 2010 at
Studentersamfundet, home of NTNU's
student society. Presentation from
the winner, PhD candidate Ida Aglen.

Completion

When the PhD candidates have been well received and their doctoral projects are under way, it is important that motivation is maintained. They must be offered an academically and socially attractive environment where they are happy to work, and which enables them to complete the PhD process towards the disputation. To reduce dropout from the programme and to avoid delays, it is essential to ensure effective follow-up throughout the PhD programme.

Faculty

The faculty is responsible for the framework conditions for completion of the PhD. The faculty must ensure that there are good procedures and practices for dealing with finances, leave of absence, absence due to illness, and the like. The faculty must have procedures to ensure that progress is in accordance with the plans. Annual reporting must be implemented, separately for the candidate and the supervisor. Reporting in greater depth during the programme is to be undertaken for all candidates. The report is often referred to as the midway assessment. The candidate, supervisor, head of department and the leadership of the PhD programme participate in the reporting. The faculty is responsible for arranging a change of supervisor where necessary. In some academic groups, the faculty is responsible for offering language courses to PhD candidates. The faculty has overall responsibility for internationalization in PhD education (see NTNU's Internationalization Plan 2011–2014, approved by the Board on 25 August 2011, item 42/11).

The faculty is responsible for further development of supervisors' skills. Seminars/courses for supervisors should be arranged. PEDUP offers courses in supervision as part of skills development for academic staff (see the link in Section 5 of the list of links at the end of the brochure).

THE "HEARING"

BEST PRACTICE

An initiative to support quality assurance and inclusion of the PhD candidate in the academic community involves organizing a "hearing". The practice at some faculties is to arrange such a hearing during the first phase of the PhD process. After about a year's work, the candidate presents the project at an open meeting for the faculty. The PhD committee schedules regular times for this every semester. Hearings can last 1.5 hours for each candidate. A brief version of the project description is distributed in advance so that participants can prepare. Supervisors must attend, and the main supervisor can present a short introduction to the topic. The candidate holds a short presentation of 30 minutes, and receives comments and criticism from the audience. It is possible to designate an informal opponent with knowledge of the discipline, who can prepare comments.

The purpose of the hearing is to inform the faculty about the research being conducted, and to give PhD candidates experience in presentation and in receiving comments in a critical research environment. The hearing also provides an opportunity for the faculty to assess quality, progress, and any need for follow-up.

Responsibility for the PhD programme

The PhD programme may be headed by one person, such as a head of department, or by a committee. This role includes responsibility for the organized academic training, and for follow-up to ensure that the training is carried out in accordance with the planned schedule. The person or committee responsible for the PhD programme must review and approve annual progress reports and must participate in the midway assessment. In the event of non-conformances or expressions of concern, the person(s) with this responsibility, in cooperation with the faculty, must ensure that necessary measures are taken.

MIDWAY ASSESSMENT – EXAMPLE OF IMPLEMENTATION

BEST PRACTICE

An initiative to support quality assurance and inclusion of the PhD candidate in the academic community involves organizing midway assessment. Here is an example of how it can be organized:

- Takes place in the candidate's 3rd semester (or 4th semester of a four-year appointment).
- The department where the candidate is employed is responsible for implementation. The assessment group is nominated by the head of department; it may consist of the leader of the academic group and a member of the academic group/department.
- The PhD candidate gives an oral presentation (about 30 minutes), or a written report, describing:
 - the project status
 - planned publications
 - any non-conformances in the academic content/research project
 - time schedule, any non-conformances
 - status of the training component
 - external research visits, research cooperation, internationalization
 - supervision
- The assessment group provides a summary together with the candidate and supervisor.
- The candidate's work and progress are evaluated using the form for midway assessment.
- The assessment group will decide whether the academic development and progress/timetable of the project are satisfactory.
- If all aspects are satisfactory, the department reports this to the candidate and the supervisor.
- If some of the aspects are not satisfactory, the department takes appropriate steps, such as:
 - talking to the candidate and supervisor (together or separately)
 - requesting a new progress report by a specified deadline
 - considering measures such as changing the supervision resources or adjusting the scope of the project
 - considering termination of the PhD programme

If any aspects are not satisfactory, a request for correction is issued through a statement in writing, which includes measures from the candidate and supervisor.

Department

The department is responsible for providing a good academic and social environment for the PhD candidate. The head of department has a special responsibility to identify or receive expressions of concern, and is to take the required action in cooperation with the PhD programme coordinator and faculty. The department must ensure that the attendance of the PhD candidate at the workplace is adequate to enable effective implementation of the doctoral programme, and realization of the opportunities for mutual academic benefits between the candidate and the academic community. The department is responsible for arranging for research visits abroad.

If the PhD candidate has a contract that includes work in addition to the thesis work, the department is responsible for ensuring that the work is performed in accordance with the applicable rules for required duties (NTNU's Regulations for required duties under Section 4 in the list of links collection at the end of the brochure). The work must be organized so that it does not impede completion of the doctorate within the nominal period of study.

Supervisor

The main supervisor is the candidate's most important academic contact and has the primary academic responsibility. Co-supervisors share the academic responsibility with the main supervisor. The main supervisor must initiate regular supervision and provide the necessary follow-up for the candidate throughout the PhD programme. The frequency of contact between the candidate and supervisor must be documented in the annual progress reporting.

The main supervisor is to coordinate the cooperation with co-supervisors. Co-supervisors must ensure that their contributions are in accordance with the project's overall goals, and keep the main supervisor informed about their contact with the candidate.

EXAMPLES OF INITIATIVES FOR ACADEMIC AND SOCIAL INCLUSION OF THE PHD CANDIDATE

Academic groups can take a variety of actions to prevent feelings of isolation among PhD candidates working on their project. Some examples based on best practice:

- Academic seminars at the department, focused on relevant issues, to which PhD candidates are invited.
- Participation in active research groups.
- Workplace in/close to the academic community (academic group).
- Establishing networks and cooperation with relevant research groups at other institutions / academic environments.
- Participation in international research groups (participation together with the supervisor is encouraged).
- Defining appropriate assistant tasks early in the PhD programme (in the case of required duties).
- Including all PhD candidates in the department's common email list.
- Establishing regular meeting points, such as monthly PhD lunches, where candidates have the opportunity to raise relevant issues and questions with the PhD programme coordinator or the faculty management, and can obtain information about PhD candidates' representatives at the faculty.
- Providing support for forums, gatherings, etc. for PhD candidates.

BEST PRACTICE

Supervisors must remain informed of the progress of the candidate's work, and must follow up academic issues that might result in delays. Supervisors are responsible for reporting any non-conformances and expressions of concern.

The main supervisor is responsible for ensuring that the PhD candidate is integrated into the academic community. The supervisors are to act as door openers to other relevant experts, and actively provide information about new research results that are relevant to the PhD project. The supervisor is to contribute actively to internationalization during the PhD period and pave the way for the candidate to publish in relevant channels of high quality.

PhD candidate

The PhD candidate must prepare and update the research plan regularly. The PhD candidate must follow up action and progress plans, and must report to the supervisor if there are non-conformances or circumstances that make progress difficult. The PhD candidate must complete the organized academic training in accordance with the plan. Where relevant, the PhD candidate must document experiments, fieldwork, and the like. When required, a written basis for supervision meetings and brief reports after formal supervision meetings must be prepared. The PhD candidate must work continuously with upgrading and maintenance of literature references. The PhD candidate must contribute to planning of required duties in addition to the thesis work, and carry out any such work in accordance with the agreement.

FINAL PHASE

In the final phase, additional quality assurance may be carried out before the thesis is submitted to the committee that is to assess whether the work is worthy of being defended in a disputation

Examples of models for quality assurance in the final phase include:

- 1. External reader.*

A few months before the scheduled submission date, a draft of the thesis is sent for evaluation by a recognized researcher in the discipline. The researcher must *not* be a member of the assessment committee.
- 2. Supervision / seminar with external reader.*

An external reader is invited to a seminar in which comments on the thesis are made and the thesis is discussed with the candidate and the supervisor group.
- 3. Trial disputation.*

The department organizes a trial disputation in front of an audience. The candidate presents the thesis, and an internal or external reader presents the strengths and weaknesses of the thesis. The candidate defends his or her work.

BEST PRACTICE

Termination before the agreed time

The candidate and the institution may agree on termination of the PhD programme before the agreed time. In the event of voluntary termination, the faculty must take responsibility for determining the reasons for the candidate's wish to end the programme, and for conducting a discussion with the candidate to explore possibilities for preventing termination.

The institution may decide on enforced termination of the PhD programme before the agreed time (see the recommended national guidelines and NTNU's Regulations under Section 4 in the list of links at the end of the brochure).

Completion and submission of thesis

To be eligible for a PhD degree, the candidate must have passed the organized academic training and must submit a thesis for assessment. NTNU is responsible for ensuring that a thesis submitted for assessment areas of high quality. NTNU must therefore arrange for an assessment of the thesis that ensures it is an independent academic work of international standard and that the thesis is on a level enabling it to be published as part of the academic literature in the discipline.

Faculty

The faculty is responsible for appointing an assessment committee as proposed by the department. The faculty must ensure that the assessment committee issues its report within three months of receiving the thesis. The faculty must arrange to hold the disputation within two months of receipt of the report. Based on the assessment committee's report, the faculty decides whether the PhD thesis is worthy of defence. On the basis of the submitted thesis, the assessment committee may recommend that the faculty permits the candidate to make minor revisions to the thesis before the committee submits its final report. Such revisions must be made within three months, and the faculty then sets a new time limit for the report (see the recommended national guidelines and NTNU's Regulations under Section 4 in the list of links at the end of the brochure).

Department

The department proposes a committee for assessment of the thesis in consultation with the supervisor and approaches the members of the committee.

Supervisor

The supervisors are responsible for assessing whether the work meets the quality requirements for a PhD thesis. The supervisors must comment on the candidate's academic contribution to any work carried out in cooperation with others that is included in the thesis.

PhD candidate

The PhD candidate is responsible for preparing the doctoral thesis within the applicable time limits. In consultation with the supervisor, the PhD candidate must apply for approval of the organized academic training, and submit an application for admission to the doctoral examination with the necessary attachments (approval of the training component, copies of certificates, four copies of the thesis, list of publications with form specifying co-authorship).

The disputation

After the assessment committee has determined that the doctoral thesis is worthy of public defence, the disputation must be planned and implemented. In a disputation, the work must be publicly defended and must be a contribution to development of new knowledge in the discipline (see the detailed descriptions of the implementation of a doctoral examination in the recommended national guidelines and NTNU's Regulations under Section 4 of the list of links at the end of the brochure).

Faculty

The faculty must ensure that the thesis is available at least two weeks before the disputation. The faculty is to obtain the topic for the trial lecture from the assessment committee at least three weeks before the disputation and ensure that the topic is related to the work, but not a central part of it. The candidate is to be informed of the topic for the trial lecture ten working days before the disputation.

The faculty is to obtain a written assessment of the PhD thesis as well as assessment of the trial lecture and of the defence of the thesis from the assessment committee. The external members of the assessment committee should be requested to comment on the level of the thesis in relation to corresponding theses at their own university.

MODELS FOR THE DISPUTATION

At the disputation, the candidate must publicly present his or her thesis and defend the work against academic criticism. This is traditionally a formal and dignified occasion. However, it can be carried out in various ways that take care of different considerations in such a public defence. Common to all variants is that the candidate starts by presenting the thesis. The floor is then given to the first opponent, who provides a general description of the strengths and weaknesses of the thesis. This is followed by a longer discussion between the opponent and the candidate. After this initial opposition, several variants may be used.

- The most common procedure is that, after a break, the first opponent is followed by the second opponent, who addresses aspects of the work that have not been dealt with in the first opposition. The discussion is usually shorter than the first opposition. If anyone wishes to present questions *ex auditorio*, they notify the person presiding at the disputation during the break and can take the floor after the second opponent. *Ex auditorio* comments or questions can also be scheduled before the second opposition.
 - A variant is that the third member of the assessment committee asks the candidate questions after the second opponent. This is arranged in advance.
 - Another variant is a public debate following the second opponent. In such a debate, the whole audience to the disputation has the opportunity to take part in discussion of the work for a period agreed in advance. The debate will then replace *ex auditorio* questions.
 - An alternative to the second opposition is a round-table discussion. The candidate and committee, possibly including the supervisor, discuss the work together in front of the audience.

BEST PRACTICE

RELEVANT LINKS FOR PHD EDUCATION AT NTNU

1. NTNU's Action Plan for the Implementation of the Charter and Code:
<http://www.ntnu.no/charter-and-code> (Norwegian)

NTNU's Action Plan for the Implementation of the Charter and Code (English)
– practice and improvement measures 2010–2011
http://www.ntnu.edu/c/document_library/get_file?uuid=11b4e885-31d3-43ec-940a-24d7711b96c1&groupId=139226

2. NTNU's human resources policy (Norwegian): <http://www.ntnu.no/personalpolitikk>

Staff regulations governing the appointment process at NTNU: (Norwegian):
http://www.ntnu.no/administrasjon/avdelinger/personal/personalreglement_vit.pdf

(English): http://www.ntnu.edu/documents/139226/5840101/Personalpolitikk+for+NTNU_eng.rtf

Information about the appointment of employees at NTNU is collected on this page:
(Norwegian): http://www.ntnu.no/administrasjon/avdelinger/personal/tilsette_medarbeider/

The following regulations apply to PhD positions:
The Regulations of the Ministry of Education and Research concerning terms and conditions of employment in the posts of postdoktor (post-doctoral research fellow), stipendiat (PhD candidate), and others. (Norwegian):
<http://www.lovdata.no/cgi-wift/ldles?doc=/sf/sf/sf-20060131-0102.html>

The Regulations of the Ministry of Education and Research concerning conditions of employment (English): http://www.ntnu.no/administrasjon/avdelinger/personal/tilsette_medarbeider/regulations_postd_stip_ass.pdf

3. Link to International Researcher Support:
<http://www.ntnu.edu/research/international-researcher-support>
 Or <http://www.ntnu.no/adm/personal/nirs>

4. Regulations, rules, forms and agreements
Recommended Guidelines for the Doctor of Philosophy Degree from The Norwegian Association of Higher Education Institutions
http://www.uhr.no/ressurser/forskrifter-veiledninger-retningslinjer/doktorgrad_-_veiledninger_og_retningslinjer

Provisions (regulations, rules and agreements) regarding NTNU's PhD education are available at
<http://www.ntnu.no/forskning/doktorgrad/reglement>

Forms are available at:
<http://www.ntnu.no/forskning/doktorgrad/skjema>
NTNU's forskrift om pliktarbeid (Norwegian):
<http://www.lovdata.no/cgi-wift/ldles?doc=/sf/sf/sf-20090617-0959.html>
NTNU's Regulations for Required Duties (English):
http://www.ntnu.no/administrasjon/avdelinger/personal/pliktarbeid_stipendiater_eng.htm

5. Courses in supervision as part of skills development for academic staff
http://www.ntnu.no/plu/uniped/pedup/generell_info



Pål Kvello is a former PhD candidate at the Department of Biology. His research involved brain surgery on moths.

Administrative contacts for PhD programmes at the faculties

For international telephone calls: please dial your code for international calls +47 (country code for Norway) + the 8-digit telephone number shown below.

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Faculty of Medicine

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Faculty of Information Technology, Mathematics and Electrical Engineering

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Faculty of Engineering Science and Technology

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Faculty of Social Sciences and Technology Management

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Rector's Office - Research

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