

## **Guidelines for postgraduate students**

The purpose of these guidelines is to introduce the special practices applied by the Department of Electrical and Information Engineering at the University of Oulu with respect to scientific postgraduate studies. The department naturally gives priority to the legislation and decrees laid down for the above issues, and to the Faculty of Technology degree regulations and guidelines for postgraduate studies. Issues dealt with in the above documents will not be repeated here except for purposes of summary. In case any of these instructions conflict with higher-order instructions, the guidelines and orders of the higher level will be complied with. Readers are requested to inform the chair of the postgraduate studies steering group if any mistakes or ambiguities are found.

### **1. Why to start postgraduate studies?**

The aim of postgraduate studies is to enhance the student's knowledge of the target field and ability to conduct independent research work which stands up to critical assessment. Doctoral research work is also expected to promote the discipline by producing new scientific knowledge to be used by other researchers.

Postgraduates are frequently employed by companies as members of company research groups. In addition, a postgraduate degree is required for most university posts (e.g., senior assistant, postdoctoral research fellow, university teacher, principal lecturer at the polytechnic).

Above all, postgraduate studies are, however, an effective way of enhancing one's own knowledge and know-how: as a postgraduate student you have a moral obligation to complete studies involving the reading of approximately 4000-5000 pages. This is probably more than you would read voluntarily as part of your on-the-job personal development pursuits.

### **2. General**

The Faculty of Technology applies the Guidelines for Postgraduate Studies approved on September 10<sup>th</sup>, 2005, which are available on the faculty's Web pages. Besides the above guidelines which are meant for all the postgraduate students of the Faculty of Technology, the present document provides a few additional and supplementary instructions for the students of the Department of Electrical and Information Engineering. In addition, various templates, forms and lists of courses, etc., can be found in the department's Web pages for postgraduate studies.

Postgraduate studies have been pursued as of August 1<sup>st</sup>, 2008 according to the new degree system. Accordingly, the extent of specialized studies is 60 ECTS credits for all postgraduate students.

### **3. Prerequisites for the conferral of the right to pursue postgraduate studies**

The right to pursue postgraduate studies may be conferred on an applicant who has graduated from the Department of Electrical and Information Engineering with a Master of Science (Technology) degree and who has completed

- a master's thesis with the minimum grade *very good*
- advanced studies with the minimum average grade *good* ( $\geq 2.5$ ).

If the above prerequisites are not satisfied but the applicant has an obvious capacity for postgraduate studies, he or she may demonstrate eligibility by completing additional studies within a strict schedule. The procedure must be negotiated with the supervisor of the postgraduate degree. No right to pursue postgraduate studies may be conferred before the applicant has provided sufficient evidence of his or her eligibility.

If the applicant's master's degree is from the same field but from another university, the degree certificate may not show the average grade of the advanced studies completed by the applicant. This does not prevent the grant of the right to pursue postgraduate studies, but the matter must be discussed with the supervisor of the postgraduate degree.

If the applicant's master's degree is from a different field of technology or has been obtained from another faculty or from a foreign university, the supervisor must ensure that the applicant has adequate basic knowledge of technology to undertake postgraduate studies. For example, applicants with a previous Master of Science degree who aim to take a Licentiate of Science (Technology) or Doctor of Science (Technology) degree are frequently required to take a few extra courses in electrical and information engineering before the right to pursue postgraduate studies is conferred on them. Such additional courses are called *bridging studies*.

#### **4. Application for the right to pursue postgraduate studies**

The Department of Electrical and Information Engineering deals with applications for the right to pursue postgraduate studies in each Doctoral Program Committee Meeting, which are typically held monthly during the semesters. When the right to pursue postgraduate studies is granted to an applicant, one or more supervisors are appointed for the degree to be pursued. At least one of the supervisors must be a chair-holding professor of the department. For the application of the right to pursue postgraduate studies a master's degree certificate and a filled-in application form (from the department Web pages) are needed. The filled-in application form must state the degree to be pursued, the field of the major subject, and an approval by the proposed supervisors to undertake the supervising duty.

The Faculty of Technology has confined the choice of the major subject of postgraduate studies to subjects named in the curriculum of a faculty degree programme or line of study. Acceptable titles for major subjects can be seen in the latest Faculty of Technology study guide.

#### **5. Choice of the degree to be pursued**

The applicant may apply for the right to pursue postgraduate studies to obtain the degree of Doctor of Science (Technology), Doctor of Philosophy, or Licentiate of Science (Technology), all of which degrees include 60 ECTS credits of specialized studies. The degree to be pursued may be changed at a later stage, but it is worth noting the basic differences of the degrees at an early stage:

- Studies for the degree of Doctor of Science (Technology) end up with a doctoral dissertation in which some new scientific information relating to the target field must be presented. The

doctoral degree may be taken after a licentiate degree, or it may be based on a master's degree.

- The focus in the Licentiate of Science (Technology) degree lies in the mastery of scientific methods. Less originality is required from the findings of a licentiate study than from those of a doctoral study. Accordingly, a licentiate degree may be easier to take, if the postgraduate student's knowledge of the research field has remained fragmented due to changes in work-related duties.
- The requirements of the degree of Doctor of Philosophy are similar to those of the Doctor of Science (Technology) degree. The Doctor of Philosophy degree is appropriate for postgraduate students with a master's degree in a field other than technology when the field of postgraduate studies and doctoral dissertation does not clearly enhance the doctoral candidate's knowledge of technology. A good example of the above case is postgraduate studies in mathematics in the mathematics division of the faculty.

## **6. Financing of postgraduate studies**

The university has not reserved a budget to support postgraduate studies. During their postgraduate studies the students may make a living in one of the following ways:

- working outside the university and studying alongside the work. In this option attention must be paid to ensuring that the employer allows the research results to be published and that the research topic provided by the employer constitutes a sufficiently integral object for study.
- obtaining a teaching or postgraduate research post from the university. Some of the posts are more closely geared to teaching while others focus on research. The latter type of posts include student positions at graduate schools, which, however, often also incorporate teaching duties.
- participating as a project member in the degree supervisor's research group.
- on some occasions it is possible for postgraduate students to pursue studies on research grants awarded by various foundations. Grants do not, however, entitle the recipients to fringe benefits, e.g., occupational health services, that employers are normally eligible for. Successful postgraduate students also have a good chance to be awarded so-called personal grants.

## **7. Making a postgraduate study plan**

There are no fixed requirements nor a set of permanent courses for postgraduate studies. Instead, the so-called specialized studies, which constitute part of the degree, consist of a set of book examinations and postgraduate courses the composition of which is individually confirmed for each postgraduate student. In addition to these courses, postgraduate students may also include in their specialized studies courses from various master's degree programmes. The Faculty of Technology Guidelines for Postgraduate Studies provide further instructions on the selection of specialized studies. The postgraduate study plan is made in collaboration with the

degree supervisor usually when the students are half-way through their studies. The study plan is then taken to the department office to be submitted for approval.

The postgraduate study plan (see also The Faculty of Technology Guidelines for Postgraduate Studies) must contain a record of the specialized studies to be included in the degree with a mention of their respective fields, the supervisors appointed, course extent in ECTS credits, and the manners and dates of course completion. In addition, the topic of the doctoral dissertation/licentiate thesis and the estimated/realized schedule of degree completion are recorded in the study plan. Both the postgraduate student and the supervisor confirm the plan with their signatures.

All courses included in the postgraduate study plan are further confirmed by the department council and in this connection their suitability as postgraduate studies is assessed. The department council also evaluates how much of the course content represents master's level knowledge and how much of it can be included in postgraduate studies. Accordingly, the number of ECTS credits confirmed for a certain course may deviate from that previously assigned for the course as part of the master's level studies. However, to maintain educational harmonization, such graduate school courses that are common to several universities are confirmed according to the original proposal.

The postgraduate study plan will not be approved if the extent of each course in ECTS credits has not been confirmed. For this reason students are requested to submit promptly to their degree supervisors all course materials from the courses they have attended at other universities or graduate schools and to ask their supervisors to confirm the courses as part of their respective postgraduate study plan, provided the course is not on the list of approved postgraduate courses. New study modules are usually approved at each meeting of the department council.

## **8. Completing research work and doctoral dissertation/ licentiate thesis**

Postgraduate studies culminate in the completion of a licentiate thesis or doctoral dissertation. Instructions for research work, dissertation/thesis writing, and publication can be found, among other sources, on the Web pages of the Faculty of Technology and in the guidelines for writers of technology dissertations provided on the Web pages of the Helsinki University of Technology. Further instructions and assistance is to be obtained from the degree supervisors.

## **9. Preliminary examination of the manuscript**

The postgraduate student must see that the manuscript to be submitted for preliminary examination is grammatically and linguistically correct. In addition, the student must provide to the supervisor for filing purposes an identical copy of the manuscript submitted to the pre-examiner(s).

## **10. Procedures relating to the public examination of a doctoral dissertation**

The Faculty of Technology Web pages (<http://www.ttk.oulu.fi/opinnot/>) provide abundant information on the public examination of a doctoral dissertation. It is worth noting that, in principle, the dissertation is a public document that is assessed by the scientific community and

eventually by the faculty. Thus a copy of the dissertation (the copy 'nailed to the wall') must be available to the public for a certain period before the public examination. Then, finally, the dissertation is assessed - on the basis of the statements submitted by the opponents- by the doctoral members of the faculty council, who must also be given an opportunity to familiarize themselves with the document. The licentiate thesis, on the contrary, is assessed by the department council based on the statements provided by the supervisor of the thesis and one of the examiners.

## **11. Application for a degree certificate**

When the specialized studies have been completed and the doctoral dissertation/licentiate thesis approved, the student may apply for a degree certificate. The easiest way to do this is to use a form available on the department's Web pages for postgraduate studies. Different forms must be chosen depending on whether the degree of Licentiate of Science (Technology) or Doctor of Science (Technology) is applied for. Moreover, different forms are used for a doctoral degree taken subsequent to a prior licentiate degree and one taken directly.