

Doctoral Studies at LUT



LUT
Lappeenranta
University of Technology

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Lappeenranta University of Technology

Trailblazer. Show the way. Never follow.

Ever since it was founded in 1969, Lappeenranta University of Technology, LUT, has brought together technology and economics in a pioneering spirit. LUT's Trailblazer strategy is searching for answers to four key questions: Are we going to burn up everything? Is humanity condemned to suffer from the water it has polluted? Will waste be the grave of our future? Will we let Europe degenerate to the world's back yard? No. We will lead the way with a trailblazer spirit.

We have been ranked among the world's top 600 universities as well as among the best young universities (Times Higher Education). We are compact by size, with intensely focused operations. Our international science community encompasses 6,500 students and experts.

Finland's greenest campus:
www.greencampus.fi/en

Uni student portal

The Uni student portal is an online service that provides LUT students all of the study-related services they need.

uni.lut.fi



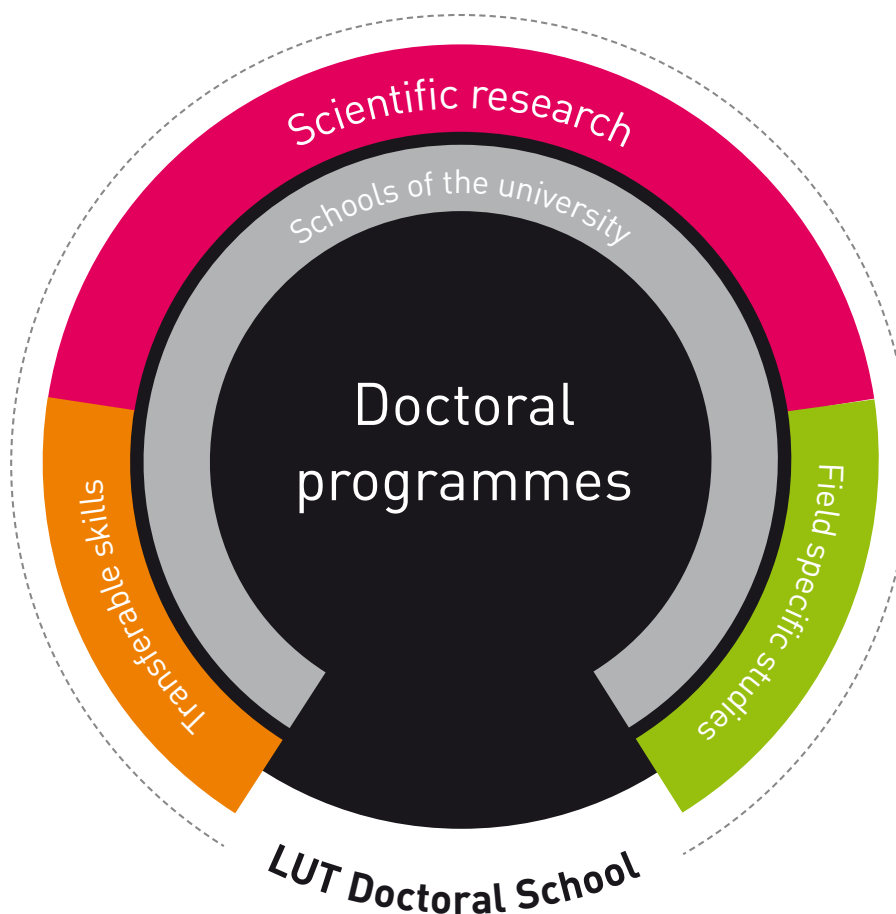
LUT Doctoral School

Aims and structure

The main objective of LUT Doctoral School (LUT DS) is to provide an environment for high-quality, research-oriented doctoral education for all LUT doctoral students. It facilitates the networking of its students by e.g. offering joint courses, lectures and workshops.

LUT DS consists of doctoral programmes and operates at the university level. It spreads good practices among the doctoral programmes of the university and gives recommendations concerning doctoral education. LUT DS is headed by the vice president for research together with the doctoral school steering group.

The three schools of the university are home to the doctoral programmes covering all of the disciplines of the university. Schools play an important role in the admission procedure and on the dissertation process. The doctoral programmes of the schools take care of the practical implementation of doctoral education and also participate in national doctoral education networks. The heads and vice-heads of the doctoral programmes are members of the doctoral school steering group.



Good practices and recommendations of LUT Doctoral School

Admission procedure and criteria

- ➔ The admission criteria are transparent and informed in detail to potential applicants.
- ➔ The application procedure follows the same basic steps in all schools.
- ➔ All information on doctoral education at LUT is available in Finnish and English in the student portal Uni.

Supervision

- ➔ Two supervisors are appointed for each student and supervisory groups are nominated where applicable.
- ➔ The maximum number of doctoral students per one supervisor is defined. However, the fluency of supervision is the key issue.
- ➔ Practical issues and targets for the first year are agreed on at the beginning of doctoral studies. This can be done by using the supervision plan.
- ➔ At least twice a year the supervisors and the doctoral student have a target discussion, in which they go through the student's progress and agree on future targets. A doctoral research assessment tool is a helpful tool to use in the discussions.

Monitoring and support

- ➔ The target time for the completion of the doctoral degree is four years.
- ➔ Part-time studies are also possible, in which case the duration of the studies is to be tailored to correspond to four years of full-time study.
- ➔ The study and research plans drawn up at the application stage are updated regularly. The final check and acceptance of the studies for graduation is done before the beginning of the dissertation process.
- ➔ The doctoral programmes follow the progress of their doctoral students regularly.
- ➔ Doctoral students have representatives in the steering group of LUT Doctoral School. In addition, doctoral programmes/schools can have tutors to help doctoral students.

- ➔ The networking of doctoral students is supported by e.g. joint courses and workshops and through national and international cooperation of doctoral programmes.
- ➔ An exchange period abroad is included in the study plan to enhance internationalisation.

Evaluation

- ➔ Manuscripts of all dissertations are submitted to the Dissertation Committee of LUT before the decision on starting the examination process.
- ➔ The quality assessment of doctoral education as a whole takes place as part of the quality system audit of LUT (external/internal).

Feedback

- ➔ LUT DS regularly gathers feedback from the doctoral students and also from each doctoral graduate.
- ➔ The feedback is handled by the steering group of LUT DS and the necessary actions are agreed upon.

Complaints/correction requests

- ➔ Possible difficulties in supervision should be discussed first with the person responsible for the doctoral programme or with the head of the school. At the university level the contact person is the head of LUT Doctoral School, i.e. vice president for research.
- ➔ Possible complaints or correction requests are handled according to the University Regulations on Education and the Completion of Studies.

Further information:

uni.lut.fi - Doctoral Studies - LUT Doctoral School and Events

1 General information on doctoral studies

During the doctoral education, the student acquires in-depth knowledge of his or her research field in order to be able to apply scientific research methods and generate new scientific knowledge independently and with due criticism within his or her research field. In addition to scientific research and studies, the doctoral student will further strengthen the transferable skills acquired during previous studies.

Completing a doctoral degree at LUT

Education leading to a doctoral degree at Lappeenranta University of Technology (LUT) is planned and organised for specific research fields. The doctoral degree requires approximately four years of full-time studies. The licentiate degree usually requires two years of full-time studies. The extent of doctoral studies is 40 ECTS credits.

LUT awards the following postgraduate degrees:

- ➔ Licentiate of Science (Technology), Doctor of Science (Technology)
- ➔ Licentiate of Science (Economics and Business Administration), Doctor of Science (Economics and Business Administration)
- ➔ Doctor of Philosophy

Doctoral education is offered in the following research fields:

- ➔ Economics and Business Administration, Industrial Engineering and Management, Software Engineering

- ➔ Computational Science, Green Chemical Technology, Technical Physics
- ➔ Electrical Engineering, Energy Engineering, Energy Market and Solar Economy, Mechanical Engineering, Sustainability Science

The research field is chosen when applying for the study right.

The primary supervisor must be a tenured professor/ associate professor or a docent of LUT. The second supervisor (when appointed) can be a person holding a doctorate.

From application to graduation

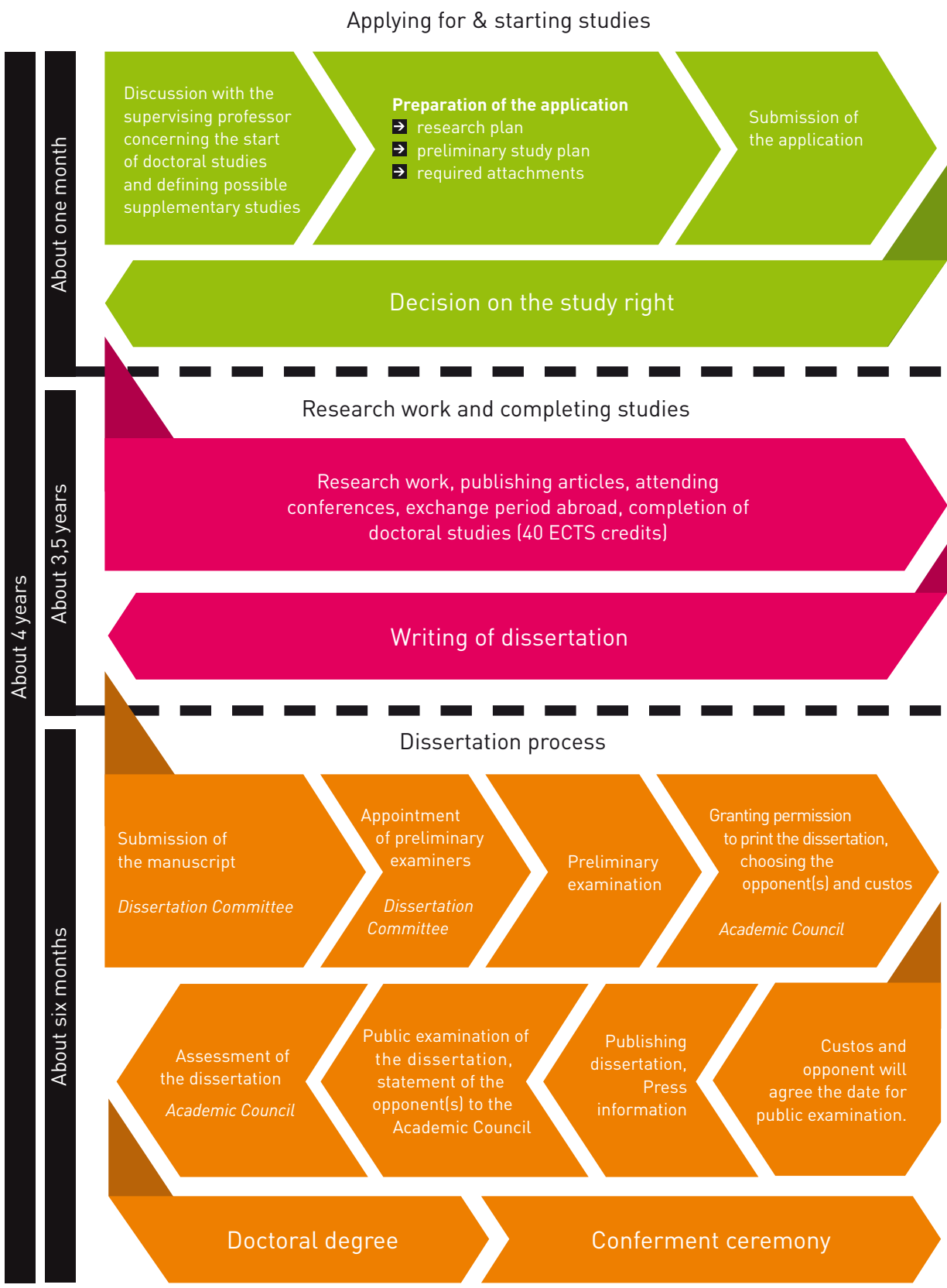
The path towards a doctoral degree can be divided into three different sections:

- 1) applying for and starting studies
- 2) research work and completing studies
- 3) dissertation process.

It is essential to see the "big picture" from the very beginning so that the studies and research work can be scheduled without unintentional delays in the process.

Further information:

uni.lut.fi - Doctoral Studies



2 Admission, supervision and funding

The aim of Lappeenranta University of Technology is to admit skilled, motivated students who have the aptitude for a career in research and other demanding expert tasks, who are committed to their doctoral studies and research and who have sufficient skills in research.

Admission criteria

- ➔ A completed higher university or comparable degree in technology, business, or another field of science, which provides a sufficient basis for further studies.
- ➔ An applicable education completed abroad which in the awarding country gives eligibility for corresponding higher education. The extent of foreign degrees should be equivalent to the Finnish Bachelor's and Master's degrees (in total 300 ECTS credits).
- ➔ Advanced studies completed in the research field or equivalent information obtained otherwise. If the applicant has not completed the required Master's level (advanced) courses, the doctoral programme decides on possible supplementary studies for each case individually.
- ➔ The foregoing also applies to applicants who have already obtained a doctoral or licentiate degree from another field of study. In addition, the applicant must complete a sufficient amount of studies in his or her field of research (major subject).
- ➔ An applicant who has completed a licentiate degree in the same field is required only to complete a doctoral dissertation to be published in the field of research in question.

In addition to the educational background of the applicant, also the following issues have an impact on the selection of doctoral students:

- ➔ the applicant's knowledge and skills (e.g. success in previous studies, language skills)
- ➔ the research topic (relevance of the topic to the university's research strategy, quality and feasibility of the research plan)
- ➔ the applicant's commitment to completing the degree
- ➔ the academic supervision capacity and/or financial resources

Supervision

Finding a supervisor

Each doctoral candidate is supervised by one or more supervisors so one of the first tasks for the potential applicant is to find a supervisor for one's doctoral studies. When the applicant has an initial idea of the research topic, he or she should continue by collecting and reviewing information on the university and the research area in question. It is also useful to check the publications of the research staff to learn more about their research focuses.

After gathering enough background information, the next step is to contact the university to check possible positions available. Taking care of the following steps will also help with finding a supervisor:

- ➔ writing a letter of motivation
- ➔ writing a compact CV
- ➔ preparing a draft research proposal
- ➔ thinking about the potential ways to finance the studies.

Supervision plan

For fluent progress in studies, it is important to ensure beforehand that different matters are understood in the same way by the parties involved in the process (the student, supervisor(s) and other possible co-operating parties, e.g. the employer).

The function of the supervision plan is to facilitate doctoral studies and to avoid possible pitfalls especially in practical issues. In the supervision plan e.g. the following aspects are recorded in writing:

- ➔ supervision
- ➔ time allocated for studies and research
- ➔ facilities
- ➔ costs

Further information:

uni.lut.fi - Doctoral Studies - Application Procedure and Supervision

Funding

Doctoral students have different alternatives to finance their studies. Common solutions include an employment relationship at the university and/or applying for different grants and scholarships. It is essential to discuss funding issues with the supervisors at the very beginning of the application process.

It is also possible to combine work outside of the university with doctoral studies. However, this is often the most demanding way to complete the degree due to the limited possibility to concentrate on research. In such cases, it is extremely important to negotiate with the employer and the supervisors on e.g. time allocated for doctoral research and practical issues.

Further information:

uni.lut.fi - Doctoral Studies - Doctoral Education at LUT

Application procedure

Technology

After initial preparation and contact with the university the applicant gets in touch with the supervisors-to-be to settle the basic issues (e.g. supervision, funding,

research field). The applicant, together with the supervisors, prepares a postgraduate study plan which is appended to the application. The plan includes

- ➔ a brief outline of studies planned
- ➔ a research plan
- ➔ a plan for publication, financing and internationalisation.

More information on submitting the application is available in Uni.

Business

Before applying for doctoral studies, the applicant must complete the separately specified prerequisite courses. After completing the courses, the applicant contacts the doctoral programme and potential supervisors to discuss the research field and the postgraduate study plan.

More information on submitting the application is available in Uni.

LUT Doctoral School also opens a call for funded positions once a year. Positions available in Technology and Business are advertised on the university web page.

Further information:

uni.lut.fi - Doctoral Studies - Application Procedure and Supervision



3 Studies and research

Doctoral studies

The doctoral student completes his or her studies (total 40 ECTS credits) in the form of doctoral programme courses or other postgraduate courses, courses offered by LUT/another university or by taking examinations on scientific literature in the field.

When starting the journey towards a doctorate it is useful to go through some dissertations in order to learn what is expected from a dissertation in the research field in question. Additionally, it is recommended that the student attends public examinations.

The study and research plans are updated regularly and checked in the yearly target discussions with the supervisor/s. The final check of the studies is done before the manuscript of the dissertation is submitted for the preliminary examination.

The aim of the target discussion between the student and the supervisor/s is to go through what has been achieved in research and studies. It is also essential to define the future steps and decide on the next appointment.

All doctoral students are encouraged to include an exchange period abroad in their doctoral studies. Attending international conferences and going for research visits are also ways of getting international experience and creating useful networks.

Further information:

uni.lut.fi - Doctoral Studies - Studies and Enrolment for the Academic Year

Research practice

Lappeenranta University of Technology requires all researchers to comply with good scientific practice when conducting or publishing research. The university has issued the LUT Code of Conduct, the purpose of which is to assure that each member of the academic community is aware of the essential requirements of e.g. legislation, agreements and ethics.

Through the LUT Code of Conduct, the university is also committed to the guidelines for responsible conduct of research and for handling alleged violations of conduct produced by the Finnish Advisory Board on Research Integrity. The document defines good scientific practice and violations of it in multidisciplinary terms.

Research articles should be published in top international scientific journals classified by the Finnish Publication Forum Project. The aim of the Publication Forum Project has been to create a system in which scientific publication activity can be evaluated on the basis of quality, not only quantity. The classification is suited for the evaluation of large publication quantities, such as all works published by a university, but not for the evaluation of an individual researcher. It can also be used for comparisons between publications in the same discipline but not for interdisciplinary comparisons.

All manuscripts of dissertations are checked with Turnitin, which is an Internet-based tool for checking the originality of the text. In addition, it can be used for guiding academic writing. The check and the interpretation of the originality report has to be done before starting the dissertation process.

Dissertation

The dissertation can be a monograph or an article-based dissertation consisting of refereed scientific publications on the research topic and a summary of them, or a collection of essays. Naturally, the dissertation shall contribute new scientific knowledge to its field. It also has to demonstrate the author's knowledge and capability to apply independently and critically the scientific methods of the research area in question. The author's contribution must be clearly stated and sufficient. Regardless of the form, all LUT dissertations should include refereed scientific publications.

Academic Library

Lappeenranta Academic Library has an extensive collection of literature titles and journals, both in print and electronic format. The library helps doctoral students with issues such as information searching, reference management systems, copyright matters, and publishing.



4 Dissertation process

The examination of a doctoral dissertation is a two-stage process including the preliminary examination and the public examination. The process officially starts when the student submits a) the manuscript of the dissertation and b) the application for permission to publish the dissertation to LUT Doctoral School.

Dissertation Committee

The Dissertation Committee of LUT has representatives from all schools of the university. It gives a statement on each dissertation manuscript before the dissertation process is set in motion, i.e. the preliminary examiners are appointed.

Preliminary examination and assessment criteria

The purpose of the preliminary examination is to establish whether the manuscript fulfils the academic requirements. The dissertation should not be submitted for preliminary examination unless the author and the supervisor consider it ready. The preliminary examiners are not expected to do the work of the supervisor, but they may provide valuable comments and suggestions for the improvement of the dissertation. There are criteria concerning the selection of preliminary examiners. The same criteria can be applied to the choice of opponents, as well.

The preliminary examiners should pay attention to the following points:

- ➔ the scientific value of the work (e.g. novelty, significance)
- ➔ scientific correctness, methodology and objectivity
- ➔ the doctoral candidate's contribution, considering also his or her role in joint publications
- ➔ coherence (i.e. does the manuscript compose a coherent, unified entity?)

- ➔ clarity of the research questions and objectives
- ➔ logical organisation, presentation and language.

Further information:

uni.lut.fi - Doctoral Studies - Dissertation Committee and Preliminary Examination

Permission to print and choice of opponents

Based on the statements from the preliminary examiners, the Academic Council decides on granting permission to print the dissertation and also on appointing the opponent(s) for the public examination. The criteria for choosing opponents are the same as for preliminary examiners.

In addition to the opponent(s), the Academic Council appoints the custos (chair) for the public examination, who is usually the supervisor of the dissertation.

The doctoral candidate may print the dissertation after the Academic Council grants permission. At Lappeenranta University of Technology, dissertations are recommended to be published in the publication series Acta Universitatis Lappeenrantaensis. More information can be obtained from Lappeenranta Academic Library.

Public examination and assessment

The dissertation must be on public display for ten calendar days before the public examination, the date and place of which the custos and the opponent/s agree on together. At the public examination, the opponent (or one of the opponents) first gives a short oral statement concerning the position and the scientific significance of the dissertation in its field. After this, the doctoral dissertation is examined and the opponent/s pose the doctoral candidate both general and detailed questions



concerning the work. The examination usually takes two to three hours. However, the maximum duration of an examination is four hours.

At the end of the public examination, the opponent (or one of the opponents) orally presents a final statement in which he or she evaluates

- ➔ the merits and the deficiencies of the work, taking into account its scientific novelty value
- ➔ the way the work has been carried out
- ➔ its results and documentation
- ➔ the ability of the doctoral candidate to defend his or her work at the public examination.

After the public examination, the opponent/s prepare a written statement on the dissertation. This may also be a joint statement. In addition to the oral statement at the public examination, the opponents may bring forth in their written statement certain new points that arose at the examination.

The final statement shall be closed by grading the dissertation (approved or approved with distinction). Based on the final statement/s, the Academic Council decides whether the doctoral dissertation can be approved and gives it a grade.

Graduation

On the basis of the dissertation approved by the Academic Council and on the doctoral studies taken, the president of LUT approves the doctorate.

The degree certificate states

- ➔ the degree awarded and the doctoral programme
- ➔ the research field
- ➔ the title and grade of the doctoral dissertation.

In addition, the doctoral degree certificate includes information on the public examination of the dissertation, the opponent/s and the custos.

The certificates of Doctor of Science in Technology, Doctor of Science in Economics and Business Administration and Doctor of Philosophy entitle a person to the corresponding doctor's degree.

Each graduate receives a student feedback questionnaire including questions on doctoral education at LUT. The feedback is handled yearly by the steering group of LUT Doctoral School.

Conferment ceremony

At regular intervals, Lappeenranta University of Technology arranges a conferment ceremony at which the doctoral hat is officially presented to the graduate. In addition, the doctoral sword is given to those with a doctorate in business administration or philosophy. The doctoral hat may be bought and worn before the conferment ceremony. Nevertheless, these unique academic festivities are recommended to all those who have obtained a doctorate.

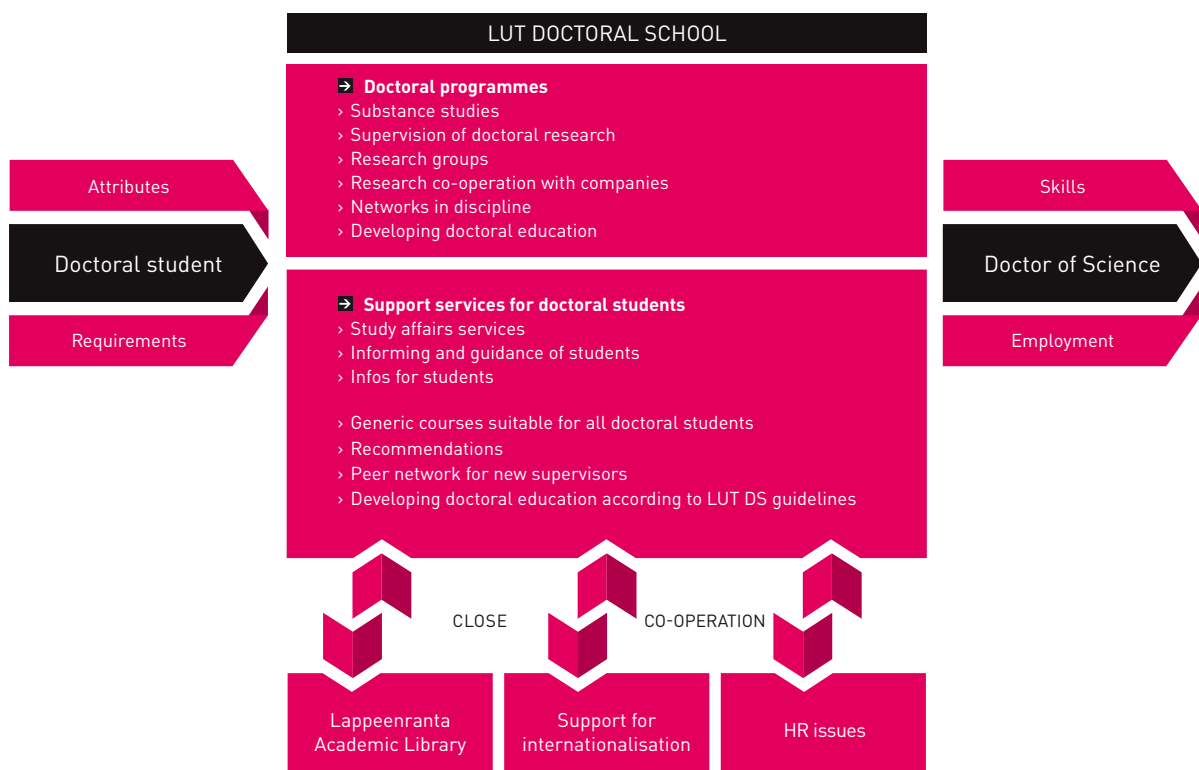
Further information:

uni.lut.fi - Doctoral Studies - Permission to Print, Public Examination and Graduation

5 Support for doctoral students

LUT Doctoral School together with the doctoral programmes offers guidance and support for doctoral students. The doctoral programmes are responsible for supervision and education in their own field. LUT

DS coordinates doctoral education at the university level and co-operates with the schools and doctoral programmes of the university in issues connected to doctoral studies.



LUT Doctoral School study affairs personnel helps applicants and doctoral students with

- ➔ applications for doctoral studies
- ➔ study-related issues
- ➔ changing/adding a supervisor

and offers guidance on

- ➔ submitting the manuscript to the Dissertation Committee
- ➔ appointing the preliminary examiners

- ➔ obtaining permission to print
- ➔ appointing the opponent(s)
- ➔ the approval and grading of a dissertation
- ➔ degree certificates and graduation.

Further information:

uni.lut.fi - Doctoral Studies - Study Guidance and Feedback



Zooming energy markets

Petr Spodniak, Doctoral student (Technology and Business)

During my Master's studies at the LUT School of Business I found that I had become very interested in energy markets and smart grids. My master thesis was supervised by two professors from different faculties, LUT School of Business and LUT Energy. Therefore, these studies have already brought me into cross-disciplinary research. In my doctoral studies I have discovered the global outreach of the research community, which is also nurtured at LUT.

But the most important thing I have learned so far is that research problems are very complex. Finding your own contribution to the research field can also be a challenging task. It is necessary to have a lot of persistence and self-control while conducting your own research.



Science brings nationalities closer

Maria Mamelkina, Doctoral student (Technology)

I took my Master's degree at LUT as a double degree student so the university and the staff were familiar to me even before I started my doctoral studies. I have always wanted to understand the things going on around us; doctoral studies give good practical and theoretical knowledge for that. You also have a chance to go deeper with the topic you are interested in. For me, it is water treatment.

Also the personality of my supervisors and the international aspect of doctoral education fascinated me. I feel that science can bring nationalities closer when people from different countries try to find solutions for problems together. A career in industry or in academia both interest me but teaching is near my heart; I am quite confident that you can really learn something only when you understand it clearly and follow the logic.



Inspiring community

Kalle A. Piirainen, Doctor of Science (Technology)

I began my postgraduate studies because research turned out to be both interesting and rewarding. The atmosphere at the department was inspiring as a product of a community of like-minded postgraduate students.

A postgraduate degree is like a driver's licence for research, it proves you have the skills to work as an independent researcher. However, in-depth understanding of a certain subject can be an advantage also in the industry. The same analytical and project management skills apply in research and industry just the same.

Visiting conferences helped to establish cooperation with Europe and the United States. Right now, I work as a postdoctoral researcher with the North Sea offshore wind power cluster at the Technical University of Denmark - DTU.

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