

Doctoral studies at LUT Industrial Management

1. General information

Industrial management is the applied science of industrial enterprise. It looks at a company's operations comprehensively and its technical, economic and behavioural processes collectively. Its purpose is to exploit technology in an efficient, economic and ecological way. With the help of industrial management, opportunities to analyze and improve productivity, competitiveness and profitability are created.

In the management and research of industrial operations, a deeper knowledge of the interplay between technology and finances is needed. The purpose of industrial management postgraduate studies is to prepare researchers and high-level experts for these kinds of activities in service of universities and other institutes of higher learning, industry and the public sector.

Postgraduate degrees

Doctoral and licentiate degrees completed at university are postgraduate science degrees. The faculty awards the following postgraduate science degrees:

- Doctor of Science (Technology)
- Licentiate of Science (Technology)

If the applicant does not have a Master of Science degree or equivalent (for example a Master of Science degree completed in a related field at a foreign university), he or she may alternatively apply for the right to complete a doctorate in Philosophy. This does not require a previous degree in a technical field or previous knowledge in the prerequisite courses done in addition to postgraduate studies.

Study privileges

Applicants to postgraduate studies must have a Master of Science (M.Sc. (Tech) or other applicable Master's degree completed at university. The applicant must have master's degree-level studies or their equivalent in the proposed area of postgraduate study. The Doctor of Science (Technology) degree requires a scientific technology background. Additional prerequisite studies can be required to make up missing knowledge in the research area or technical discipline.

Goals of postgraduate study

According to the rules for teaching and studying at LUT, the objectives of postgraduate studies are that the student:

- deepens his/her knowledge of his/her area of research and its effect on society as well as attains the necessary skills to independently and critically apply scientific research methods and to create new scientific knowledge in his/her area of research.
- familiarizes him/herself well to the developments, basic problems and research methods in his/her area of study, as well as
- achieves such a level of knowledge of general scientific theory and other areas related to his/her area of research that he/she can follow their development.

Once accepted into the program for doctoral studies, the student must:

1. complete postgraduate studies,
2. show independent and critical thought related to his/her area of research, and
3. produce a dissertation and defend it publicly.

The doctoral dissertation must contain new scientific information. The scope of a doctoral degree is the equivalent of four years of full time study. For a student who has completed his/her licentiate degree in the same area of research, only point three (3) mentioned above is required.

A licentiate degree is made up of points one (1) and two (2) of the doctoral degree as well as licentiate research work. The rules for teaching and studying at LUT state that the student must have a good understanding of, as well as the ability to think independently and critically about his/her area of research. Moreover, licentiate research must show that the student is able to use scientific research methods. Literature research can be accepted as licentiate research as well. The length of a licentiate degree is two years of full time study.

Postgraduate areas of research

The area of research is the major area of studies which is indicated when applying for postgraduate studies. Studies, as well as the doctoral dissertation (or licentiate research) is carried out in this area. Each area of research has one or more designated supervisors. A supervisor can be a professor, docent or professor's substitute who has completed his/her doctoral degree. If the area of research or supervisor changes, the postgraduate student and new supervisor must write an application for transfer to the Head of Study Affairs.

Postgraduate areas of research

ID	Research area	Supervisor
3100	Engineering and Technology Management	Tuominen, Markku Kässi, Tuomo Rantanen, Hannu Hilmola, Olli-Pekka
3120	Corporate Strategies	Kässi, Tuomo Tuominen, Markku
3131	Technology Management	Tuominen, Markku Kässi, Tuomo Torkkeli, Marko
3140	Decision Support Systems in Industrial Engineering and Management	Tuominen, Markku
3145	Information and Knowledge Management	Kärkkäinen, Hannu Tuominen, Markku
3155	Innovation Systems	Harmaakorpi, Vesa
3157	Performance Management	Rantanen, Hannu Kärri, Timo
3159	Cost Management	Kärri, Timo Rantanen, Hannu
3165	Entrepreneurship in Technology	Lehtomaa, Ahti
3180	Industrial Engineering and Management, Management of Human Resource	Miettinen, Asko
3190	Management of Small and Medium-Sized Enterprises	Lehtomaa, Ahti Miettinen, Asko
3310	Supply Chain and Operations Management	Pirttilä, Timo Huiskonen, Janne Hilmola, Olli-Pekka
3320	Safety Management	Laitinen, Heikki
3510	International Business in Industrial Enterprises	Väätänen, Juha
3520	Industrial Marketing	Salminen, Risto Pitkänen, Seppo

2. The process of postgraduate studies

Discussing the initiation of postgraduate studies with the supervising professor
- preparing a postgraduate study plan and postgraduate study application

Submitting the application for postgraduate studies to the Faculty Council
- submitted to the Head of Study Affairs
- the application is addressed by the Faculty Council and the rector's decision announced

Conducting postgraduate studies under the supervision of a professor
- conducting research and completing 60 study points (incl. any preliminary knowledge)

Getting the Faculty Council's approval for the qualification requirements i.e., completed post-graduate studies
- application should be submitted to the Head of Study Affairs

The Faculty Council appoints reviewers for a licentiate dissertation
- application should be submitted to the Head of Study Affairs

The Faculty Council evaluates the licentiate dissertation after receiving the reviewer's statement

Licentiate diploma

Applying for the permit for public defence of the dissertation
- submitting the application and 4 copies of the manuscript of the dissertation to the LUT's Dissertation Council and the Faculty Council meeting
- submitting a manuscript of the dissertation to the LUT's Dissertation Council
- the Faculty Council appoints the pre-examiners

Granting the permit for public defence of the dissertation
- after receiving the pre-examiners' statements, the Faculty Council decides on the granting of the permit for printing and public defence of the dissertation
- the Faculty Council appoints opponents and a person to oversee the dissertation

Public defence of dissertation, the opponent's statement to the Faculty Council

The Faculty Council evaluates the dissertation

Doctoral degree

Doctoral promotional ceremony

Applying for study privileges

Application to postgraduate study usually begins by getting in contact with the supervising professor of the student's future area of research (major area of study). Initial negotiations are carried out with the professor about postgraduate studies and the application and plan for postgraduate studies are drawn up for the Faculty Council. There are no specific times for application because applications for postgraduate studies are considered monthly (July notwithstanding).

The application and plan for postgraduate studies are delivered to the faculty's Head of Study Affairs, who then presents them to the Faculty Council and Rector. The Faculty Council decides whether or not to support the application to the Rector, confirms the study plan and decides who will supervise the student's studies as well as if prerequisite studies are required. After the Faculty Council has rendered its decision, the Rector decides on whether or not to grant the right to postgraduate studies. The applicant is informed of the decision by mail.

The plan for postgraduate studies includes a) a brief research plan (1-2 sheets of A4 paper) and b) an outline for completing studies. The student prepares the plan for postgraduate studies together with his/her supervising professor. Both the student and the supervising professor must sign the plan (updated, Faculty Council decision 10 Sept 2008).

The research areas assigned to specific professors and docents can be found in appendix 1 of this handbook. The application form for postgraduate studies can be found [here](#).

Registration

The postgraduate student must inform the University each academic year whether he/she will be present and attending courses or not. The University will mail registration forms for the following academic year in June to addresses in the student register. New postgraduate students will receive their registration forms with their letter of acceptance.

Degree requirements

The degree requirements for postgraduate studies is 60 ECTS credits. Studies are divided into two (2) parts: courses related to the area of research and those that support the area of research, which must also include methodological studies.

	ECTS credits	Explanation
Studies related to the area of research	35-40	Major area of study as indicated on application for right to study. This includes confirmed postgraduate courses or book exams.
Studies supporting the area of research	20-25	Supplement major area of study. Studies may include master's and bachelor's level courses in the major area of study that have not been done for the student's undergraduate degree.
<i>Methodological studies</i>		<i>General science or methodological courses between 5 and 15 study points in scope. Could be placed in either studies related to or supporting the area of research.</i>

Studies related to the area of research

At the postgraduate level, the main focus is the amount and quality of studies. Studies related to the area of research are dissertation or licentiate-related, which, together with master's level advanced special studies, provide the base for research.

Master's degree studies do not normally qualify for studies related to the area of research. However, certain advanced special studies courses have been exceptionally accepted as postgraduate level courses. N.B. The student cannot include these advanced special studies in his/her undergraduate degree if he/she wants to claim them as postgraduate studies.

Master of Science courses qualifying for postgraduate course status:

- CS10A0400 Projektien markkinoinnin erityiskysymyksiä (5 ECTS credits)
- CS10A0650 Management of High-tech Enterprises and Innovations in Russia (5 ECTS credits)
- CS20A0350 Toimitusketjun johtamisen teoriatyöpaja (5 ECTS credits)
- CS30A0500 Kustannuslaskennan erityiskysymyksiä (7 ECTS credits)
- CS30A0660 Suorituskyvyn menestyksellinen ohjaaminen (5 ECTS credits)
- CS30A0670 Suorituskyvyn johtamisen näkökulmat (5 ECTS credits)
- CS30A1000 Tuote- ja teknologiastrategia: Innovaatiojohtamisen jatkokurssi (7 ECTS credits)
- CS30A1050 Teknologian johtamisen menetelmät (6 ECTS credits)
- CS30A1551 System Dynamics and Industrial Management (5 ECTS credits)
- CS34A0500 Technology Commercialization and Corporate Venturing (5 ECTS credits)

Studies supporting the area of research

Studies supporting the area research:

- are not studies related to the area of research,
- support doctoral/licentiate work and can be studies from many various fields,
- are generally at least advanced level master's courses,
- up to half of supporting studies can be made up of subject level courses (lower/upper undergraduate courses) or university level training courses for professional development.
- are mainly taught by professors other than the supervising professor. The names of the examiners must be included in the application for acceptance of degree studies (see below).

Eight (8) ECTS credits of the 25-ECTS credit university pedagogy minor can be counted towards studies supporting the area of research. Participation in the university pedagogy minor in the Department of Industrial Management can be negotiated with Professor Risto Salminen.

Methodological studies

The purpose of methodological studies is to give the student basic skills for doing independent scientific research. These studies can include for example research methods, results publication and presentation skills among others. Methodological studies can be placed in studies related to research and/or studies supporting research at the supervising professor's discretion.

Acceptance of degree requirements

The student must apply for acceptance of his/her completed degree requirements before the preliminary examination of the student's dissertation begins. This means clarified and detailed information about completed studies related to the area of research and studies supporting the area of research.

Forms for presenting completed degree requirements can be found here: [Postgraduate forms](#)

Completing studies

The contents of the postgraduate student's studies are drawn up with the supervising professor. Postgraduate studies are mainly completed using the following methods:

- book exams and summaries
- postgraduate courses,
- In house, national and international postgraduate seminars, where postgraduate students present their work,
- scientific conferences

Normally the student's level of knowledge gained through various postgraduate courses is tested using book exams. In exceptional cases, exams can be done orally. Summaries can also be done at the professor's discretion. Participation in lecture courses or seminars is not enough to prove that knowledge has been attained. Individual special studies attainments are assessed mainly using a grading scale of one (1) to five (5).

Postgraduate courses include periods of study specifically organized for postgraduate students by the university and graduate schools. The National Graduate School for Industrial Management organizes study periods, in which postgraduate students of the department have participated actively. In addition to postgraduate study periods at LUT, Helsinki University of Technology, Oulu University, Åbo Akademi and Tampere University of Technology have also organized postgraduate study periods in Industrial Management. Furthermore, Business Administration courses (such as KATAJA courses) can also be included in these study periods. Finally, international courses (such as EIASM) are possible as well.

Industrial Management postgraduate seminars at LUT are usually discipline-specific or professor-specific, for example in the case of workshop-type events where current research work is further developed. During national postgraduate seminars (such as Arctic Workshop), students' own research is presented to researchers and professors in the field, from whom then can receive feedback.

International research schools give students the opportunity to familiarize themselves with other research institutes and to make contacts with other researchers. They usually are longer in duration: from one week up to many months. Some examples of research schools are The Summer School in Technology Management, Young Scientist Summer Programme at IIASA and the European Doctoral Programme in Entrepreneurship and Small Business Management.

Conference publications that the postgraduate student has done can also be considered as completed studies at the discretion of the supervising professor, as long as the publications are not included in an article-based dissertation. However, only a maximum of eight (8) ECTS credits (five (5) credit weeks) from conferences and seminars can be counted towards fulfilling degree requirements.

It is recommended that postgraduate students completing doctoral studies observe doctoral defence events in their discipline as part of their studies. If the postgraduate student attends five (5) defence events, writes a summary of each one and submits them to the supervising professor, the student may receive one (1) study point.

Structure and content of dissertation

The dissertation is the proof of the postgraduate student's ability to do independent and critical research work. The novelty and impact / significance of the results, as well as their logical, objective, critical and thorough handling, must reach the same general level of previously accepted dissertations. The dissertation can contain things presented in licentiate work but the licentiate work itself cannot be one of the references used. References used must also fulfil the requirements set out for the dissertation.

A dissertation can be either a cohesive independent document written by the author him/herself (monograph) or can be a collection (article-based dissertation).

A monograph is an independent and cohesive text, which extensively explains all of the methods and results related to the research. It is not necessary to present a postgraduate student's own publications separately and they are referenced, when needed, as other publications.

A collection or article-based dissertation is made up of individual articles, mainly reviewed and approved for publication in journals or conference publications. These texts collectively deal with a specific issue. An article-based dissertation includes the abovementioned documents, which require a brief summary section (usually around 30-80 pages). The summary should present the issue in its entirety and deal with it comprehensively as well as explain the main sections of the publications used. The summary section can introduce critiques and conclusions that are not included in any of the other publications used.

The publication used in the article-based dissertation can include collectively written articles if the student's own independent part can be identified and proven as his/her own. Normally, approved principles for using partial publications in article-based dissertations are as follows:

- Normally, one partial publication can be used for only one dissertation.
- The first author of the collectively written article has the right to use the publication in his/her dissertation. In the case where one of the other authors wants to use the publication in his/her dissertation, he/she must seek permission from the first author and the supervisor of the work.
- If the article-based dissertation belongs to a collection, the author must present a brief summary together with an objective explanation of his/her own part of the work. More detailed information of the author's own part is given to the preliminary examiners of the dissertation if required.
- The author is responsible for securing all of the rights to republish the texts in his/her article dissertation (i.e. getting permission from the publisher who has the copyright for the article).

Inspection of dissertation

There is an excellent, comprehensive information package on the University's website about the different stages of the dissertation inspection process. There, you can also find other information dealing with the final stages of postgraduate study, such as doctoral degrees and promotion. The link to the web pages is: [Dissertation process](#).

Applying for the degree

A postgraduate student does not have to apply for his/her degree separately. The degree is drawn up for presentation when all of the required studies (and previous knowledge requirement, if mentioned in the original study plan) have been registered and the dissertation has been approved by the Faculty Council. Please contact the head of the study affairs, Katri Tyster in this matter.

Supervisors of Postgraduate Studies, contact information and research areas.

Harmaakorpi, Vesa (Lahti) (040 575 1965)	<ul style="list-style-type: none"> - Innovation systems - Innovation strategies - Innovation policies
Hilmola, Olli-Pekka (Kouvola) (040 7614307)	<ul style="list-style-type: none"> - Railway logistics - Macrologistics - Supply chain management, particularly contract manufacturing and product development - Quantitative modelling
Huiskonen, Janne (05 621 2641)	<ul style="list-style-type: none"> - Materials management in supply chain - Management of demand and control information - Spare parts logistics - Customer service policies in logistics
Kärkkäinen, Hannu (040-849 0228)	<ul style="list-style-type: none"> - Knowledge management
Kärri, Timo (05 621 2636)	<ul style="list-style-type: none"> - Investment planning - Industrial cost models - Accounting models for hospital environments
Kässi, Tuomo (040 586 4174)	<ul style="list-style-type: none"> - Strategic planning - Product and technology strategies - Technology and innovation management - Industrial clusters
Laitinen, Heikki (0400 602154)	<ul style="list-style-type: none"> - Safety management
Lehtomaa, Ahti (05 6212668)	<ul style="list-style-type: none"> - SME management - Entrepreneurial behaviour - Start-up of new technology enterprises
Miettinen, Asko (040 5223381)	<ul style="list-style-type: none"> - Organizations - Human resources - Leadership - SME management
Pirttilä, Timo (0400 908 426)	<ul style="list-style-type: none"> - Product and customer management - Acquisitions management - Internal logistic processes - Organization and management of logistics process development
Pitkänen, Seppo (040 754 8994)	<ul style="list-style-type: none"> - Marketing and business research - International operations - Forecasts - Buyer and consumer behaviour
Rantanen, Hannu (Lahti) (040 558 7237)	<ul style="list-style-type: none"> - Productivity - Cost analysis - Investment analysis - Performance analysis
Salminen, Risto (05 6212645)	<ul style="list-style-type: none"> - Industrial marketing and business relationships - Project marketing - Marketing planning - Industrial management pedagogy

Torkkeli, Marko (Kouvola) (040 7611223)	- Evaluation of the business potential of technology - Evaluation and choice of technology - Support systems for decision making - Strategic entrepreneurship
Tuominen, Markku (0400 555426)	- Technological management: <ul style="list-style-type: none">• Product development and strategy• Innovation management• Technology investment planning processes - Information systems: <ul style="list-style-type: none">• Knowledge management• Decision support systems in industrial management• Computer-aided strategic analysis
Väätänen, Juha (040 526 1518)	- International business management - Russia and transitional economies: business environment

Study affairs services for postgraduate students

Application to postgraduate studies and degree requirements to the Faculty Council are handled by:

- Katri Tyster, Head of Study Affairs, Faculty of Technology Management (040-3524001)
- Susanna Koponen (substitute), Study Coordinator, Faculty of Technology Management (040-3524002)

Postgraduate register, transcripts, dissertation process and degrees are handled by:

- Eeva Häyrinen, Research and Innovation Services