Doctoral programme — The Built Environment and Society: Management, Economics and Law

The programme description was approved by Fakultetsnämnden (Faculty Board) November 30, 2010. Valid from Spring 11.

Programme description (KTHSHB)

Programme name

The Built Environment and Society: Management, Economics and Law (Samhällsbyggnad: Management, ekonomi och juridik)

Subject area

Doctoral Programme The Built Environment and Society: Management, economics and law encompasses a wide spectra of social scientific issues relating to the built environment and society and the connection. Research in this area is based on basic economic and legal sciences and utilises them for analysing issues concerning what affects the built environment and society, and effects, on e.g. economic development.

The programme includes three subjects at postgraduate level: Real Estate and Construction Management, Business Studies and Economics. Syllabuses for these subjects are found in Appendix 1.1-1.3.

Comment: 2013-04-23 The faculty council decided to move the subject of Economics from the doctoral programme of the built environment and society: Management, economics and law to the doctoral programme of industrial management and organisation at the School of industrial engineering and management.

The subject is linked to central activity bases within the School of Architecture and the Built Environment, and is one of the school's key subject areas in which there will be further investments, according to the annual operational agreement with the President.

The doctoral programme’s overall purpose and learning outcomes

The programme's overall objective is consistent with the objectives agreed for KTH doctoral studies 2009-02-24, which are described below.
The purpose of KTH postgraduate studies is to provide society with competent researchers who can contribute to its sustainable development.

The goal of KTH postgraduate studies is for doctoral students to become independent and excellent researchers. After completing their studies, doctoral students shall be able to:

- describe and explain theories and empirical results in the field in question
- formulate specific research issues in the field in question
- use scientific method and develop new knowledge through their own scientific studies
- critically analyse and evaluate the methods and results from their own and others' scientific studies
- present and discuss research findings in the scientific community
- present research in an educational way outside the scientific community and in educational contexts
- assess the ethical aspects of research within the field in question and act on these
- identify the needs of new knowledge, and understand how to initiate and direct research projects.

Education at postgraduate level shall also strive to ensure that students after graduation are able to:

- participate in interdisciplinary collaboration within the field in question
- analyze the role of research in sustainable development.

*These goals expired 2014-12-09 according to the President's decision, reference number V-2014-0374. As before, the objectives of the education at postgraduate level are consistent with the objectives specified for the doctoral degree in the Higher Education Ordinance, Appendix 2 Degree Ordinance.*

The doctoral programme consists of coursework comprising of at least 90 credits and a thesis that comprise of 150 credits. A licentiate degree must consist of a coursework of at least 45 credits and a licentiate thesis comprising of 75 credits.

Within the framework of the doctoral programme regular courses are organised. Compulsory courses are to be given at least every two years, and there should be a course plan extending through two years. Within the doctoral programme, regular seminars are being organised for the purpose of broadening the doctoral students' knowledge and create a stimulating intellectual environment.

The focus is also for the postgraduate students to annually take part in international conferences and in national networks that enable them to establish contacts with the industry and gain knowledge about current problems and trends in the sector.

Otherwise, no special infrastructure programme is necessary.

**The doctoral programme’s size and recruitment**

In total, the doctoral programme houses around 50 doctoral students, of which 30 is found in the field of Real Estate and Construction Management, just under 10 in the field of Economics and just above 10 in the field of Business Studies.

Currently in the doctoral programme, there are 11 professors and 4 associate professors. There are approximately another 20 postdoctoral researchers who may serve as assistant supervisor. Appendix 2 provides a list of people eligible to be main supervisor.
Recruitment of doctoral students is mainly done through advertising in accordance with KTH general rules. This has allowed us to recruit from a more diverse educational background.

The eligibility of admission to doctoral studies at KTH is spelled out in the central framework of rules. This doctoral programme does not practice any additional regulation. The doctoral students represented have primarily a master's degree; master of engineering in the relevant field or a degree in architecture, or an equivalent degree in economics or law from other universities. The selection of students is based on the applicant's qualifications, which are assessed in the background of the current project's area of specialisation.

**Funding**

The doctoral students are financed primarily with external funding from research councils or the industry. Doctoral students, currently less than 10 people, belonging to partnership programmes with foreign universities are usually financed by scholarships.

**Courses**

The courses within the doctoral programme are all offered within a third-cycle subject and are therefore presented in the study plan for the subject.

**Quality enhancement activities**

Quality enhancement activities are intended to ensure that the objectives of the programme are achieved. The work can be described from the different stages of the process:

- Admission. There is a general framework within KTH to support the selection of suitable persons for admission. The department does not practice any additional regulation.
- Courses: The courses are described above. The courses are followed by a written evaluation.
- Seminars: The department has a lunch seminar every week where both proposals and results are presented and discussed. Special seminars are organised for the latter part of the dissertation work (see below).
- Presenting research at international fora: The doctoral students should participate and present papers at international conferences. The aim is for this to be done once a year, and for the doctoral student to spend at least a couple of months with a foreign research group during the doctoral student’s post graduate studies.
- It is important for doctoral students in the subject to keep themselves informed about current trends and perspectives within the field, and to establish their own contact network. This can be done through participation in industry connected seminars, through continued professional development arranged by the department and contract education. If beneficial, the projects should also be linked to reference groups including representatives from the industry.
- Quality control during the dissertation process: If a licentiate thesis is not presented, a midterm seminar should take its place. It is essential for the quality of the work to have an active supervisory group, where the assistant supervisor can take a larger responsibility.

As for quality control in the latter stage of the dissertation, the following should be observed:
• Monograph: A seminar with the special examiners should be held around 6 months before expected defense of thesis.
• Compilation thesis: If papers already are accepted, only a seminar reading of remaining articles is necessary before the defense.

A thesis should have a content equivalent to four articles publishable in reputable journals of the field. The quality of doctoral dissertations and licentiate thesis designed as monographs is assessed according to the practice developed, and common to other Swedish university departments, conducting research studies in this area.

To develop the doctoral programme, all supervisors should have a meeting at least once a year to examine the licentiate and doctoral theses submitted during the year. The purpose is to learn more about how the quality can be further increased. Once a year, there should also be a doctoral student meeting with the purpose of an open discussion about what works well and what can be improved in the doctoral programme.

The course requirements and quality enhancement activities as described above, result in the programme clearly meeting the requirements of national and local degree ordinance.

**National and international network**

The above is enumerated and defined in appendix 3.

**Further instructions for registration**

*Real Estate, real estate law and project communication*

Real estate and project communication with in KTH, participate in more organised cooperations through the Forum for industrialized architecture and building and Stadsbyggnadsakademin.

In Sweden, we are members of a network in the field of Construction Management with the universities of Lund, Gothenburg and Luleå, in which we are organizing regular workshops for doctoral students. We are also involved in the cooperation; Swedish Universities of the Built Environment. Researchers are participating in the Stockholm Centre for Commercial Law which is linked to Stockholm University, as well as collaborating with the so-called Byggherregruppen, an association of major developers and builders. Cooperation on regular basis take place with Vägverket and Banverket, amongst other governmental agencies.

Examples of international networks where researchers participate: Actively involved in international organizations such as European Real Estate Society and the European Network for Housing Research. Collaboration in regard of PhD courses with Helsinki University of Technology. We have regular contacts regarding research and education with i.a. University of Helsinki, Aberdeen, UMB / Aas, ITC / Twente, TU Delft, Ljubljana and Bahir Dar / Ethiopia. The Department is part of the association European Academy for Land Use Planning. Established networks are Planning and Property Law and the Land for Housing in Europe.

These partnerships can be further developed by new communications technologies, such as collaborative virtual seminars.
Business

Doctoral students in business have the opportunity to participate in international research exchange existing within the field of business. For example it is possible to stay at Stanford University in California through the SCANCOR programme, under the leadership of internationally renowned American scientists. KTH Business research is applied science. The research is largely financed by the industry. The doctoral students’ research can benefit greatly from contacts with the business community through access to unique data and dissemination of research results.

Economics

Within the field of economics, work is underway to start up a research exchange programme with Hitotsubashi University. There is also on-going collaborations with Max Planck Institute and George Mason University. Additional exchange programs are planned.

As described above, there exists a close collaboration with the economic departments in the Stockholm area, as well as with the Research Institute of Industrial Economics (IFN). The section also cooperates with Svenskt näringsliv, who’s CFO, Stefan Fölster, is an adjunct professor at the section. Pontus Braunerhjelm, also professor at the section, leads Swedish Entrepreneurship Forum. Vinnova is an important research financier and is also sponsoring a doctoral course (Innovation in the Service Sector). The sector’s research is also closely connected to the Centre of Excellence for Science and Innovation Studies (CESIS). Several projects have been funded by major Swedish companies that are part of the section’s network, such as AstraZeneca and Sandvik.

Appendixes

Appendix 1.1: Study plan for third-cycle subject Business studies (BUSINADM).

Appendix 1.2: Study plan for third-cycle subject Real Estate and Construction Management (FASTBYGG).

Appendix 1.3: Study plan for third-cycle subject Economics (NATIONEK).

Appendix 2: List containing names and subject areas of supervisors within the programme

Appendix 3: Presentation of the programme’s national and international network
Doctoral programme — The Built Environment and Society: Management, Economics and Law

Appendix 1.1: Study plan for third-cycle subject Business studies (BUSINADM).

The subject plan was approved by Fakultetsnämnden (Faculty Board) November 30, 2010. Valid from Spring 11.

Subject title

Business studies (Företagsekonomi)

Subject description and programme outcomes

Scientific field

The main content of the subject Business Administration at the doctoral level is the study of the company in a wide sense in society. The company is perceived as an organization of people and resources that work together to achieve added value and qualities in interaction with local communities, industry and individuals. The subject provides an insight into the issues and methods used in the analysis of problems and opportunities in companies and organizational systems. The theories developed in business administration also make use of knowledge from other disciplines; mainly from economics, philosophy, construction and real estate economics, urban planning, psychology and industrial economics.

Goal

In particular, those who have completed the doctoral programme must have a thorough knowledge of the subject of business administration, as well as training and knowledge of relevant theory, methods and application. Doctoral studies also aim at providing students with the theoretical and practical ability to independently plan, manage and implement research, projects, and to communicate and explain the application of results.

Description of possible specialisation

The subject has no specialisations.

Specification of how the programme outcomes are to be achieved
The educational goals are achieved by following the individual study plan with the support of the supervisors; taking courses, attending seminars, participate in national and international conferences.

**Current research**

**Programme structure**

The principal structure of the course is that it includes studies corresponding to 240 ECTS. In addition to a scientific (doctoral) thesis of 150 ECTS, the doctoral programme includes coursework of 90 ECTS. Of the total coursework, at least 60% must be at doctoral level, of which 30 ECTS are obligatory.

Doctoral studies consists of coursework and a dissertation/thesis part. They are carried out under the guidance of a main supervisor, along with at least one assistant supervisor, in accordance with an individual study plan. Students' individual study plans will be adapted to their prior knowledge and dissertation/thesis work orientation. A doctoral student's progress will be assessed at least once a year in connection with a review of the individual study plan, and will be carried out by the student and main supervisor. The study plan is ratified by the Director of Third Cycle Education.

A licentiate degree is obtained after completed studies in business administration at the doctoral level. Studies correspond to 120 ECTS. In addition to a scientific dissertation of 75 ECTS, a licentiate degree includes courses of 45 ECTS.

Courses at the doctoral level can be taken both at KTH and externally. Obligatory courses are quantitative and qualitative methods, scientific theory and a common introductory course of 7.5 ECTS for the doctoral programme. In general, advanced courses in methodology and theory of 15 ECTS are recommended.

It is recommended that doctoral students work in parallel with the dissertation/thesis and doctoral courses during the programme, and that courses are studied to a greater extent during the first half of the programme.

**Seminars and conferences**

It is assumed that the student actively participates in research seminars, which includes regularly submitting original texts. This takes place in consultation with supervisors. The student must also participate in national and international conferences and research networks in the relevant subject area.

**Compulsory and recommended courses**

Courses shall be studied in accordance with the agreement made between students and main supervisors in the individual study plan.

Courses in business administration can be taken at KTH and other Swedish or foreign institutions. The following course list indicates the obligatory and non-obligatory courses taught at KTH. Taking courses outside KTH is an important part of the programme since different universities have different areas of specialisation.

For a licentiate degree, the course in scientific theory and at least one of the other courses are obligatory.
Graduate students who teach in programmes at first or second level must have completed initial university teacher training.

**Literature in the dissertation/thesis area**

Literature is established by the main supervisor in consultation with the student. Students may include courses from other scientific disciplines which contribute to the student's orientation in relevant non-business administration areas of the thesis.

**Compulsory courses**

- FAI3002 Quantitative Methods with Real Estate Applications 7.5 hp. Or equivalent
- F1N5114 Theory of Science and Research Methodology, Social Science 7.5 hp. Or equivalent
- FAI3102 Economics, Organization and Incentives- Introduction Course 7.5 hp. Or equivalent
- F1F5412 Qualitative Research Methods in Scientific Dissertations 7.5 hp. Or equivalent

**Recommended courses**

- F1N5310 Quantitative Methods, Structural Equation Modelling - LISREL 7.5 hp.
- FAI3004 Publishing in Business Studies 7.5 hp.
- F1N5309 The Financial System in Theory and Practice 7.5 hp.

**Thesis**

Dissertation/thesis work is an obligatory part of doctoral studies. This part of the programme aims at the student developing the ability to make independent contributions to research and the capacity for scientific cooperation, within and outside their own subject area. The dissertation/thesis shall contain new research results that the student has developed, alone or in cooperation with others. The main scientific results should meet the quality requirements for publication in internationally recognized journals with peer review. A doctoral student's contribution to a dissertation/thesis text that has multiple authors must be distinguishable.

Licentiate dissertations and theses must be written in English. They shall normally be in the form of a collection of scientific articles, together with a special written summary.

A thesis may be based on a licentiate dissertation.

**Entry requirements and selection**

**General and special admission requirements and prior knowledge**

The KTH general eligibility requirements for admission to doctoral level studies apply.

Doctoral students are expected to read and write scientific English and speak English fluently. Applicants are strongly recommended to have at least 60 ECTS in business administration, or the equivalent, as prior knowledge. It is assumed that doctoral students with engineering science and natural science as prior knowledge will work with a dissertation/thesis subject in which this knowledge will be beneficial.
Selection rules and procedures

Admission to studies at the doctoral level is decided by the school director after preparation by the programme council and the proposed main supervisor.

In addition to applicants being examined for eligibility, their degree of maturity and capacity for independent judgement and critical analysis is assessed, as well as written scientific presentation, which forms the basis of admissions decisions and the selection of applicants. Of great significance in this assessment are previous study results in advanced courses at undergraduate level, independently conducted scientific studies, and the ability to apply research.

The programme’s degrees and examinations

Degree of Licentiate and Degree of Doctor (PhD)

The doctoral studies programme consists of coursework of at least 90 ECTS and a thesis of 150 ECTS. A licentiate degree shall include at least 45 ECTS of coursework and a licentiate dissertation of 75 ECTS.

The programme’s examinations

Doctoral courses include examinations, which may be written or oral. Examinations shall be designed so that examiners can be satisfied that the student has assimilated the full course content.
Doctoral programme — The Built Environment and Society: Management, Economics and Law

Appendix 1.2: Study plan for third-cycle subject Real Estate and Construction Management (FASTBYGG).

The subject plan was approved by Fakultetsnämnden (Faculty Board) November 30, 2010. Valid from Spring 11.

Subject title

Real Estate and Construction Management (Fastigheter och byggande)

Subject description and programme outcomes

Scientific field

The subject area of Real Estate and Construction Management covers legal, financial and management issues related to property management, property development and construction.

Description of possible specialisation

The subject has no specialisations.

Specification of how the programme outcomes are to be achieved

The educational goals are achieved by following the individual study plan with the support of the supervisors; taking courses, attending seminars, participate in national and international conferences.

Current research

Programme structure

The doctoral programme consists of coursework which must include at least 90 ECTS and a thesis of 150 ECTS. For a licentiate degree, at least 45 ECTS of coursework shall be included and a licentiate dissertation of 75 ECTS.

The Director of Third Cycle Education shall establish and at least once a year review the individual study plan. This review will be prepared by the supervisors and the doctoral student.
Doctoral students will participate in regular seminars organized within the doctoral programme with the aim of broadening students' knowledge and create a stimulating intellectual environment.

The aim is also for doctoral students to annually participate in international conferences and in national networks, thus enabling contacts with companies in the industry and gaining knowledge of current issues and development trends in the sector.

**Compulsory and recommended courses**

Courses with the following scope and content are obligatory:

1. **IN5114 Theory of Science and Research Methodology, Social Science** (7.5 ECTS). This course can also be credited from a master's programme in which such a course is included.

2. **AI3002 Quantitative methods with real estate applications** (7.5 ECTS). The core of the course will be applied regression analysis and statistical hypothesis testing. The course Quantitative Methods with Real Estate Applications covers this area. Other courses covering this area may be studied, either at KTH or in doctoral programmes in Economics at Stockholm University and the Stockholm School of Economics.

3. **1F5412 Qualitative research methods in scientific dissertations** (7.5 ECTS). Case studies, interviews or questionnaires are used in many studies. This course will provide the knowledge to conduct such studies in a professional manner. The course Qualitative Research Methods in Scientific Dissertations covers this area.

4. **AI3102 Economics, Organization and Incentives - Introduction Course** 7.5 hp. There are several key questions in this subject area, including the relationship between public and private sectors and industrial organizations; e.g. what is done within a company or purchased at a market; why a market has a certain structure. Issues of incentives and information are crucial in all these contexts as well as project management. This course aims to convey the theoretical base established by economists such as Ronald Coase and Oliver Williamsson. The course will replace the current course that the department provides, “Economics, organization and incentives”.

The total course component includes, as mentioned above, 90 ECTS and the obligatory courses thus includes 30 ECTS. All these courses are core study courses.

The course **Scientific theory and research methodology** plus at least one of the other mandatory courses are obligatory for a licentiate degree.

The choice of non-obligatory courses is governed by the dissertation/thesis content and is made in connection with the establishment of an individual study plan for the doctoral student. The following key study courses are listed below.

The courses are generally studied within the framework of the doctoral programme regular courses. It is recommended that doctoral students read one or more core study courses at other institutions/universities.

Doctoral students who teach at first or second levels must have completed initial university teacher training.
Compulsory courses

- FAI3102 Economics, Organization and Incentives- Introduction Course 7.5 hp. Or equivalent
- F1F5412 Qualitative Research Methods in Scientific Dissertations 7.5 hp. Or equivalent
- F1N5114 Theory of Science and Research Methodology, Social Science 7.5 hp. Or equivalent
- FAI3002 Quantitative Methods with Real Estate Applications 7.5 hp. Or equivalent

Recommended courses

- F1N5307 Application of Game Theory in Real Estate Economics 7.5 hp.
- F1F5404 History of Enclosure, Land Tenure, Taxation.. 7.5 hp.
- FAI3006 Construction Management and Economics 7.5 hp.
- F1N5302 Theories and Methods for Management of Real Estate 7.5 hp.
- F1F5408 Real Estate Theory 7.5 hp.
- F1F5314 Microeconomic Theory 7.5 hp.
- F1F5320 Topics in Housing and Real Estate Economics 7.5 hp. Recommended seminar course in which participation and presentation is required
- F1F5406 Distributive Justice and Land Development 7.5 hp.
- F1N5350 Property Studies - Research Front, Minor Course 7.5 hp.
- FAI3001 Housing Economics 7.5 hp.
- F1F5308 Real Estate Appraisal 7.5 hp.

Thesis

The dissertation/thesis may be either a monograph or a compilation dissertation/thesis.

Quality control during the thesis process: If a licentiate dissertation is not submitted, an intermediate seminar shall be presented. It is important for quality that there is an active supervisory group, in which the assistant supervisor takes much responsibility.

With regard to quality control in the later stages, the following applies:

- Monographs: A seminar with a special examiner should be carried out about 6 months prior to the viva voce.
- Compilation thesis: If the articles are already accepted, only a seminar discussion of other articles for the dissertation is required.

A compilation thesis should in terms of content correspond to four articles of sufficient quality for publication in good international journals with peer review in the area in question. For a licentiate dissertation the corresponding requirement is two articles.

The quality of theses and dissertations in the form of monographs are assessed by the practice that has developed, and in common with other Swedish institutions that conduct research studies in this area.

Entry requirements and selection

General and special admission requirements and prior knowledge
Eligibility for admission to doctoral studies at KTH is described in the general regulations and no further formal rules apply to the doctoral programme. Examples of an appropriate educational background are a master's degree, master of engineering degree in the relevant field or a degree in architecture, or an equivalent degree in economics or law from other universities. The selection of students is based on the applicant's qualifications, which are assessed in the background of the current project's area of specialisation.

Selection rules and procedures

The programme’s degrees and examinations

Degree of Licentiate and Degree of Doctor (PhD)

The doctoral studies programme consists of coursework of at least 90 ECTS and a thesis of 150 ECTS. A licentiate degree shall include at least 45 ECTS of coursework and a licentiate dissertation of 75 ECTS.

The programme’s examinations

Doctoral courses include examinations, which may be written or oral. Examinations shall be designed so that examiners can be satisfied that the student has assimilated the full course content.
Doctoral programme — The Built Environment and Society: Management, Economics and Law

Appendix 1.3: Study plan for third-cycle subject Economics (NATIONEK).

The subject plan was approved by Fakultetsnämnden (Faculty Board) November 30, 2010. Valid from Spring 11.

Subject title

Economics (Nationalekonomi)

Subject description and programme outcomes

Scientific field

General regulations and guidelines for doctoral studies are found in the comprehensive KTH regulations for doctoral studies. This syllabus complements those regulations and guidelines for doctoral studies in the subject of economics with specific instructions for the subject area.

The doctoral subject of Economics is part of the doctoral programme, “The Built Environment and Society: Management, Economics and Law”.

Comment: 2013-04-23 The Faculty Council decided to move the subject Economics from the doctoral programme of The Built Environment and Society: Management, Economics and Law to the doctoral programme of Industrial economics and management, School of Industrial Engineering and Management.

The subject of economics has strong connections to engineering science, mathematics and industrial economics. Historically, for example, economic production theory was developed and nourished by engineering science and financial mathematics currently plays a key role in the rapidly growing part of economics known as financial economics. There are also significant interfaces between optimization theory and the economical analysis of equilibrium conditions in different markets, and, for example, between technological development and opportunities to establish new markets. Ongoing globalization of different markets requires, like many recent pricing and charging systems, modern information and communication technologies.

Goal
Doctoral studies in economics aim at providing students with in-depth knowledge of economic theory and good ability to apply economic theory. Students will also gain critical awareness, skills in research methodology and independent research experience, and after completing doctoral studies they will be well prepared for continued scientific activities.

Description of possible specialisation

The subject has no specialisations.

Specification of how the programme outcomes are to be achieved

The educational goals are achieved by following the individual study plan with the support of the supervisors; taking courses, attending seminars, participate in national and international conferences.

Current research

Programme structure

Doctoral studies consist of coursework and a thesis/dissertation part. Coursework may be in the form of lectures, literature studies and problem-solving, as well as active participation in seminars and conferences. Courses may be studied within the department or in collaboration with other national and international research institutions. Most of the coursework will be covered in the initial part of the programme.

Doctoral studies are conducted under the direction of a main supervisor, together with one or more assistant supervisors in accordance with an individual study plan approved by the doctoral programme officer. Students' individual study plans will be adapted to the area of specialization of their dissertation/thesis. Students' progress will be assessed at least once a year in connection with a review of the individual study plan jointly carried out by the student and the main supervisor.

A licentiate degree may be taken as part of a doctor's degree or in conclusion of doctoral studies. Courses and dissertation work included in a licentiate degree may also be credited towards a doctor’s degree.

The doctoral studies programme consists of coursework of at least 90 ECTS and a thesis of 150 ECTS. A licentiate degree shall include at least 45 ECTS of coursework and a licentiate dissertation of 75 ECTS.

Compulsory and recommended courses

Compulsory courses totalling 30 ECTS, including courses in Scientific theory and research methodology, Quantitative methodology (econometrics) 7.5 ECTS, Qualitative methodology (7.5 ECTS) and a common introductory course for the doctoral programme (7.5 ECTS) - refer to the description of the doctoral programme for further details.

Other basic courses and advanced courses for 60 ECTS.

The courses aim to provide a breadth of theoretical knowledge in micro and macro theory, econometrics and scientific theory with the history of economic doctrines. The main part of the basic courses are shared with the doctoral programmes at the University of Stockholm and the Stockholm School of Economics. The advanced courses provide specialisation in the subject areas and are established after consultation.
between the supervisor and the student. The programme has applied microeconomics as its primary area of specialisation. Areas of application are oriented towards engineering and community planning, and include transport economics, urban and regional economics and industrial economics.

Doctoral students who teach in education at first or second levels must have completed initial university teacher training.

**Compulsory courses**

- F1N5114 Theory of Science and Research Methodology, Social Science 7.5 hp.
- FAI3102 Economics, Organization and Incentives- Introduction Course 7.5 hp.
- F1F5412 Qualitative Research Methods in Scientific Dissertations 7.5 hp.
- FAI3002 Quantitative Methods with Real Estate Applications 7.5 hp.

**Thesis**

The student must write a dissertation/thesis defended in public at a viva voce. The dissertation/thesis must demonstrate the student's ability to independently examine a research problem of importance in the field of economics. The dissertation/thesis may be in the form of a single work or a compilation of several essays of sufficient quality for publication in good international journals with peer review. The student should generally begin dissertation/thesis work after the first year of study and thus carry out dissertation/thesis work in parallel with the remaining course studies.

**Teaching**

Teaching consists mainly of lectures, seminars and tutorials. During the programme, students must participate in scientific activities at the department through attending seminars, guest lectures, etc. Corresponding activities at other departments may also be included in the programme. Teaching and examinations at another department or university may be included with the consent of the main supervisor.

**Entry requirements and selection**

**General and special admission requirements and prior knowledge**

The KTH general eligibility requirements for admission to doctoral studies apply. Admission to the doctoral program requires that the applicant has a Master's degree in economics, econometrics, or statistics, or an equivalent degree to a Swedish Master of Science. The selection of doctoral students is based on the applicants' qualifications, which relevance will be judged in relation to the area of each specific research project.

**Selection rules and procedures**

Admission of students to doctoral studies is granted by the dean of the school. The basis for selection is the ability to assimilate doctoral studies. Selection is firstly made on the basis of documented materials supplied by the applicant. In addition, other bases for decision such as interviews with the candidates and contacts from previous educational programmes may be of importance. Students must be prepared to
devote at least 50% of their time to doctoral studies. For the doctoral programme, only the number of students that can be offered acceptable conditions in terms of supervision, funding and study conditions in general may be admitted.

The programme’s degrees and examinations

Degree of Licentiate and Degree of Doctor (PhD)

The doctoral studies programme consists of coursework of at least 90 ECTS and a thesis of 150 ECTS. A licentiate degree shall include at least 45 ECTS of coursework and a licentiate dissertation of 75 ECTS.

One stage of the doctoral programme of 120 ECTS may be concluded with a licentiate degree. Requirements for a licentiate degree are that the tests in phase one are passed and that a dissertation of 75 ECTS is passed. Obligatory courses for the licentiate degree comprise the course Scientific theory and research methodology, and at least one of the other obligatory courses.

The programme’s examinations

Examination takes place through written or oral exams or through presentations at seminars. Exams and tests are graded as pass or fail. The examination shall be designed so that examiners can be satisfied that a student has assimilated the full course content.

The grade of a thesis (pass/fail) is determined by an examining committee appointed by the school's Director of Third Cycle Education.
Doctoral programme — The Built Environment and Society: Management, Economics and Law

Appendix 3: Presentation of the programme’s national and international network

The programme description was approved by Fakultetsnämnden (Faculty Board) November 30, 2010. Valid from Spring 11.

Real Estate, real estate law and project communication

Real estate and project communication with in KTH, participate in more organised cooperations through the Forum for industrialized architecture and building and Stadsbyggnadsakademin.

In Sweden, we are members of a network in the field of Construction Management with the universities of Lund, Gothenburg and Luleå, in which we are organizing regular workshops for doctoral students. We are also involved in the cooperation; Swedish Universities of the Built Environment. Researchers are participating in the Stockholm Centre for Commercial Law which is linked to Stockholm University, as well as collaborating with the so-called Byggherregruppen, an association of major developers and builders. Cooperation on regular basis take place with Vägverket and Banverket, amongst other governmental agencies.

Examples of international networks where researchers participate: Actively involved in international organizations such as European Real Estate Society and the European Network for Housing Research. Collaboration in regard of PhD courses with Helsinki University of Technology. We have regular contacts regarding research and education with i.a. University of Helsinki, Aberdeen, UMB / Aas, ITC / Twente, TU Delft, Ljubljana and Bahir Dar / Ethiopia. The Department is part of the association European Academy for Land Use Planning. Established networks are Planning and Property Law and the Land for Housing in Europe.

These partnerships can be further developed by new communications technologies, such as collaborative virtual seminars.

Business

Doctoral students in business have the opportunity to participate in international research exchange existing within the field of business. For example it is possible to stay at Stanford University in California through the SCANCOR programme, under the leadership of internationally renowned American scientists.
KTH Business research is applied science. The research is largely financed by the industry. The doctoral students’ research can benefit greatly from contacts with the business community through access to unique data and dissemination of research results.

**Economics**

Within the field of economics, work is underway to start up a research exchange programme with Hitotsubashi University. There is also on-going collaborations with Max Planck Institute and George Mason University. Additional exchange programs are planned.

As described above, there exists a close collaboration with the economic departments in the Stockholm area, as well as with the Research Institute of Industrial Economics (IFN). The section also cooperates with Svenskt näringsliv, who’s CFO, Stefan Fölster, is an adjunct professor at the section. Pontus Brauerhjelm, also professor at the section, leads Swedish Entrepreneurship Forum. Vinnova is an important research financier and is also sponsoring a doctoral course (Innovation in the Service Sector). The sector’s research is also closely connected to the Centre of Excellence for Science and Innovation Studies (CESIS). Several projects have been funded by major Swedish companies that are part of the section’s network, such as AstraZeneca and Sandvik.