



ROYAL INSTITUTE
OF TECHNOLOGY

Syllabus for doctoral studies in the subject of

PLANNING AND DECISION ANALYSIS

School of Architecture and the Built Environment, KTH

General regulations and guidelines for doctoral studies are found in the comprehensive KTH regulations for doctoral studies. This syllabus for the subject of Planning and Decision Analysis at the doctoral level complements the general regulations and guidelines with the following specific instructions for the subject area.

1. SUBJECT DESCRIPTION

The subject of Planning and Decision Analysis includes scientific studies that aim to improve and critically examine the basis for planning and decisions, especially decisions having major long-term consequences. Theories and data from many different fields of knowledge are used in such studies. The subject-specific skills developed within the doctoral programme are intended for the critical evaluation and integration of such theories and data, and the assessment of their relevance and uncertainties. The theoretical basis is taken from e.g. planning theory, decision theory, environmental systems analysis and theory of science. The subject is divided into three areas of specialization:

- Urban and regional studies
- Environmental strategic analysis
- Risk and safety

Area of specialization - Urban and regional studies

The area of specialization *Urban and regional studies* consists of the analysis of phenomena and processes that may be affected by overall urban and regional planning. The focus is on sustainable development and management of society, land and the built environment. It includes a view of planning as a changing and democratic process over time in which players with different resources and motives interact with each other. An important perspective in all research in this subject is to see society as an expression of different social, cultural, economic and ecological driving forces, in which changes in one part often have consequences in other parts as well as the whole. A focus is linked to the study of players who in various ways seek to influence society and the built environment; their power resources and institutional conditions, the division of roles between them and forms of collaboration and conflict

management. The area's scientific tools are taken from the technical, scientific, humanistic and social science disciplines. Particular emphasis is on theories and methods for the study of sustainable development of society.

Area of specialization - Environmental strategic analysis

The area of specialization *Environmental strategic analysis* is the analysis of long-term solutions and knowledge-building on major environmental problems that require long-term solutions. The research focuses on environmental problems that are strategically important globally and/or in Sweden, but may also include environmental problems that are strategically important for an industry, a company or an authority. A systems perspective is applied in this research, in which a social context is taken into account in analysis of both technological development, infrastructure and processes of change. Broader studies of social and economical sustainable development may also be included in the research. Research in the area of environmental strategic analysis includes futures studies and tools for environmental assessment and environmental management. Processes of change are also studied, which include research on behaviour, lifestyles and policies.

Area of specialization - Risk and safety

The area of specialization *Risk and safety* consists of risk analysis, reliability, vulnerability and security in technical and socio-technical systems. Such analyses aim at providing a basis for decisions on risk prevention and safety promotion measures. Research in this area benefits from knowledge in different areas such as technology, natural science, medical science, social science and behavioral science, which contribute to assessing risk and safety. The subject-specific skill lies in analyzing such data in an integrated way that gives a balanced picture for decision-making purposes. The method chosen is highly dependent on the type of risk and safety issues to be treated. A combination of quantitative and non-quantitative methods is often appropriate. This subject area also includes studies of risk perception and risk communication, as well as the social processes in which risk and safety issues are addressed.

2. GOALS OF THE PROGRAMME

The overall goals for doctoral studies in the subject of Planning and Decision Analysis correspond to the general objectives for KTH doctoral studies. These are set out in the box below:

The purpose of KTH doctoral studies is to provide society with competent researchers who can contribute to its sustainable development.

The goal of KTH doctoral 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 analyze and evaluate the methods and results from 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 needs for new knowledge, and understand how to initiate and direct research projects.

Education at doctoral 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 development of society.

The main objective is to provide a basis for further independent research activities as researcher, practitioner or teacher. Doctoral studies shall give students a good overview of the field and sound theoretical and methodological training. This includes the ability to independently formulate and solve research tasks, to collaborate in interdisciplinary exchanges and to communicate research results to the scientific community and other clients. We strive for active participation in national and international research networks in the area.

More specifically, the purpose of doctoral studies in planning and decision analysis is to provide society with qualified scientists and specialists who can contribute to the process of sustainable development. This requires that doctoral students can critically analyze their research and their own role in society. On completion of the programme, doctoral students in planning and decision analysis will be able to contribute to scientifically-based decision making, which critically examines the assumptions on which decisions affecting society are taken.

Studies at doctoral level are carried out essentially within one area of application. After graduation, students shall be able to:

- use scientific methods within the area of application to critically analyze complex planning and decision-making situations, examine them from the goal of a sustainable society, and where appropriate, propose solutions for sustainable development
- critically analyze scientific texts and planning and decision-making documents in the area of application
- in a competent manner, detect and distinguish between uncertainties in planning and decision-making documents in the area of application, and identify needs for research and investigation which these uncertainties give rise to
- participate in cross-disciplinary discussions and collaboration within the area of application
- present and, in an educational way, explain theories and empirical results in the area of application and be able to discuss these results within the scientific community and with policy makers and people affected by the decisions
- assess the ethical aspects of their own research as well as other planning and decision making processes in the area of application

Doctoral studies should strive for students who, after graduation, will:

- have an overview of key trends in international developments in the area of application, both

scientifically and socially, and in particular with regard to conditions for the sustainable development of society

- have an overview of the subject of planning and decision analysis in a much broader area than their own area of application

- be able to initiate and lead new research projects

3. GENERAL STRUCTURE OF PROGRAMME

Doctoral studies consist of a course component and a dissertation/thesis part. The course component may consist of lectures, literature studies and problem-solving, and active participation in seminars. Courses may be studied at KTH or in collaboration with other Swedish or foreign research institutions.

Doctoral studies are conducted under the direction 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 the area of the dissertation/thesis. The doctoral programme coordinator will establish, and at least once a year review, the individual study plan. The main supervisor and the student will together draw up a document in the form of a proposal for a study plan prior to reviews.

A licentiate degree may be taken as part of a doctor's degree. Courses and dissertation work included in the licentiate degree may also be credited towards a doctor's degree. The licentiate degree consists of a course component of 30-37.5 ECTS and a dissertation part of 82.5-90 ECTS, totalling 120 ECTS. A doctor's degree consists of a course component of 60-75 ECTS and a thesis of 165-180 ECTS, giving a total of 240 ECTS. Further requirements are stated in the description of each area of specialization.

4. COURSES

For a doctor's degree in the subject of Planning and Decision Analysis, the following three shared compulsory courses must have been taken.

Theory and analysis of decision-making	7.5 ECTS	central study course, advanced
Theory and methodology of science	7.5 ECTS	central study course, research skills
Essay in popular science	3.0 ECTS	other course, skills

For a licentiate degree, at least one of the courses Theory and analysis of decision-making and Theory and methodology of science must have been completed.

Additional requirements for compulsory courses are made for each area of specialization.

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

Area of specialization - Urban and regional studies

The licentiate degree consists of a course component of 30 ECTS and a dissertation part of 90

ECTS, giving a sum of 120 ECTS. A doctor's degree consists of a course component of 60 ECTS and a thesis of 180 ECTS, giving a total of 240 ECTS.

For a doctor's degree in the area of specialization *Urban and regional studies*, the following courses are compulsory.

Theory and analysis of decision-making	7.5 ECTS	central study course, advanced
Theory and methodology of science	7.5 ECTS	central study course, research skills
Essay in popular science	3.0 ECTS	other course, skills
Planning Theory	7.5 ECTS	central study course, advanced

For the licentiate degree, 15 ECTS from the compulsory courses for the doctor's degree must have been completed, including either Theory and analysis of decision-making or Theory and methodology of science. It is often appropriate to read both Theory and analysis of decision-making and Theory and methodology of science early in the programme.

Other courses are selected mainly from the following recommended subject areas:

- Players, planning and planning processes
- Housing quality, trade and service
- Discourse analysis
- Case study methodology
- Governance and institutional capacity
- Sustainable development
- Cultural heritage and management
- Environmental justice and gender theory
- Mobility and transport
- Educational methodology
- Place analysis and habitat
- Regional science
- Space, power, meaning
- Urban and regional economics
- Urban and regional infrastructure
- Urban planning and design

Area of specialization - Environmental strategic analysis

A licentiate degree consists of a course component of 30 ECTS and a dissertation part of 90 ECTS, equal to 120 ECTS. A doctor's degree consists of a course component of 60 ECTS and a thesis part of 180 ECTS, giving a total of 240 ECTS.

For a doctor's degree in the area of specialization *Environmental strategies analysis*, the following courses are compulsory:

Theory and analysis of decision-making	7.5 ECTS	central study course, advanced
Theory and methodology of science	7.5 ECTS	central study course, research skills
Essay in popular science	3.0 ECTS	other course, skills
Environmental strategic methods	7.5 ECTS	central study course, advanced

For a licentiate degree, 15 ECTS of required courses for the doctor's degree must have been

completed, including either Theory and analysis of decision-making or Theory and methodology of science. It is often appropriate to read both Theory and analysis of decision-making and Theory and methodology of science early in the programme.

Other courses are selected mainly from the following recommended subject areas:

- Case study methodology
- Futures studies and forecasts
- Geographic information systems
- Infrastructure finance and public finance
- Qualitative methods
- Life cycle analysis
- Environmental justice and gender theory
- Mobility and transport
- Educational methodology
- Planning theory
- Regional environment and development planning
- Risk philosophy
- Space, power, meaning
- Social-ecological systems
- Game theory and negotiations
- Systems analysis
- Theory of urban areas and transport systems
- Sustainable transport and urban systems

Area of specialization - Risk and safety

A licentiate degree consists of a course component of 37.5 ECTS and a dissertation part of 82.5 ECTS, totalling 120 ECTS. A doctor's degree consists of a course component of 75 ECTS and a thesis of 165 ECTS, giving a total of 240 ECTS.

For a doctor's degree in the area of specialization *Risk and safety*, the following courses are compulsory:

Theory and analysis of decision-making	7.5 ECTS	central study course, advanced
Theory and methodology of science	7.5 ECTS	central study course, research skills
Essay in popular science	3.0 ECTS	other course, skills
Philosophy of risk	7.5 ECTS	seminar course
Seminar participation in risk and safety, part1	7.5 ECTS	seminar course
Seminar participation in risk and safety, part2	7.5 ECTS	seminar course

Of these, Theory and methodology of science, Philosophy of risk and Seminar participation in the risk and safety, part 1 are also compulsory for the licentiate degree. It is often appropriate to read Theory and analysis of decision-making early in the programme.

Other courses are selected mainly from the following recommended subject areas:

- Ecotoxicological risk assessment
- Exposure analysis
- Crisis management

- Medical risk assessment
- Environmental medicine
- Environmental risk analysis
- Modelling
- Human and organizational factors in safety analysis
- Optimization science
- Probabilistic safety analysis
- Risk communication
- Risk perception
- Safety engineering
- Statistics and probability theory
- Reliability theory
- Toxicological risk assessment

5. SEMINARS AND CONFERENCES

Doctoral students will present and discuss their texts in regular seminars. They will also participate in national and international conferences in their field. Doctoral students are encouraged to present their results annually at an international scientific conference.

6. DISSERTATION/THESIS

The dissertation/thesis is a compulsory part of doctoral studies. The dissertation/thesis should normally be written as a collection of scientific articles but may also be written as a monograph. There should be a specific written summary in a dissertation/thesis.

A licentiate thesis should contain new theoretical or empirical research results in the chosen subject area or the application of existing scientific knowledge in a new area that the student has developed through theoretical or empirical research work. It will also include an overview of previous research in the chosen subject area. It must be of such quality and scope that it could be the basis of at least two research articles published in internationally recognized journals with peer review. If the student has written articles with other authors, his or her contribution must be clearly distinguishable.

A thesis for a doctor's degree must contain new theoretical or empirical research results in the chosen field of study which the student has developed through theoretical or empirical research. It will also include an overview of previous research in the chosen subject area. It must be of such quality and scope that it could be the basis of at least four research articles published in internationally recognized journals with peer review.

If the student has written articles with other authors, his contribution must be clearly distinguishable. An internal quality audit must be carried out prior to a licentiate seminar or viva voce.

Doctoral theses and licentiate dissertations are normally written in English. The licentiate dissertation may be included as part of a doctoral thesis.

7. ELIGIBILITY REQUIREMENTS AND RECOMMENDED PRIOR KNOWLEDGE

The KTH general eligibility requirements for admission to doctoral studies are applied.

Applicants are expected to read and write scientific English and speak English fluently. Applicants must also have the general ability required to benefit from the programme.

Admission to doctoral studies in Planning and Decision Analysis is decided by the school director at the School of Architecture and the Built Environment.

8. RULES FOR SELECTION OF APPLICANTS

In addition to eligibility, the degree of maturity and capacity for independent judgement and critical analysis will form the basis of selection of applicants. Of particular interest in this assessment are previous study results in advanced courses at undergraduate level or independently conducted scientific studies. Specific prior knowledge that a doctoral student may require to carry out certain doctoral work may be a criterion for selection. A number of applicants are interviewed as part of the selection process.

9. EXAMINATION

Doctoral studies in the subject area of Planning and Decision Analysis include examinations, which may be written or oral. Examinations shall be designed so that examiners can be satisfied that a student has assimilated the full course content.