



UPPSALA
UNIVERSITET

Translation of Curriculum Statement for Graduate Level (Third-level) Education

Electrical Engineering with specialization in Systems Analysis

Swedish title: Elektroteknik med inriktning mot systemanalys

TNELTE05

Swedish Curriculum adopted by the Board of the Faculty of Science and Technology (Board for Third-level Education) on on 2008-07-02. Translation approved on 2010-08-10.

The Curriculum Statement for Third-level Education consists of three parts: a general part, this subject specialized curriculum statement, and each doctoral student's individual study plan.

Objective

Utgående från den grundläggande utbildningen inom ämnesområdet skall utbildningen på forskarnivå ge ytterligare insikter och fördjupade kunskaper inom ämnet. Genom handledning och avhandlingsarbete skall doktoranden göras väl förberedd för en kritisk, kreativ och självständig forskningsverksamhet eller för annan yrkesverksamhet, där höga krav ställs på djupgående ämnesinsikt och forskningskunnande.

The doctoral student shall also be able to present her/his own goals and results orally and in writing to different target groups in English and, in the case of Swedish-speaking doctoral students, in Swedish.

Subject description

Systems Analysis is a methodological science for description and analysis of systems from a specified goal. The methods are of specific relevance when studying komlex dynamic systems and when the applications are multidisciplinary. The methods include theories and techniques for modeling and model analysis. One important technique is simulation, where experiments are performed on models of the system under study. Several of the classical methodological subjects such as mathematics and statistics are used, and they are combined



UPPSALA
UNIVERSITET

with other methods when needed to obtain a more complete picture of the system.

The rapid development within computer science has led to a fast development within systems analysis and the techniques are nowadays mainly computer based. Methods from systems analysis are applicable for many types of systems when the goal is to describe and analyze complex systems and where traditional analysis methods are not sufficient. In many applications systems analysis are close to neighboring areas. Concerning process control it approaches automatic control, when describing economic systems it is close to econometrics, and for biologic systems it is neighbor to ecology. When the study object is the human body from a systems analysis perspective it is close to biomechanics and neuroscience.

Doctoral theses in systems analysis can be directed towards development of general methods and tools for modeling or model analysis, or towards new applications of the techniques in some area.

Eligibility

Basic Eligibility

The basic eligibility for third level education is described in the general part of the curriculum statement.

Special Eligibility

A person has special eligibility for a third level program in Systems analysis if she/he has passed examinations in courses of systems analysis or in courses of areas of relevance for systems analysis, ranging a minimum of 120 HE credits. Special eligibility is regarded to be fulfilled by those who have obtained one of

- Master of Science in engineering physics or other program with the corresponding courses in mathematics, probability theory, statistics, computer science, and operations research at a Swedish university.
- In other ways, within or outside Sweden, if she/he has acquired the equivalent knowledge.

For persons with other educational background, complementary studies can be necessary for eligibility. Information can on individual basis be obtained from the responsible professor.

Admission

Applicants for third level program in Electrical Engineering with



UPPSALA
UNIVERSITET

specialization in Systems Analysis must submit an application to the head of the Department of Information Technology. Admissions to places in third level programs take place normally several times per year.

In connection with the admission it must be stated how it is planned to finance both the personal maintenance of the doctoral student, and her/his research.

Program structure

In connection with the admission, each doctoral student and her/his supervisor shall draw up an individual study plan after consultation with the professor in charge of the third level program. The plan is to be approved by the head of the department (by delegation of the Faculty Board), in connection with the admission.

The individual study plan shall be reviewed jointly by the doctoral student and her/his supervisor, annually, and be provided with a summary of the achieved results and the plans for the coming year. Significant changes and any disagreement on the individual study plan shall be reported to the head of the department or, if deemed necessary, to the Board for Third-level Education.

Courses

Within the third level program there may be different kinds of courses, such as lectures, literature studies, practical training, field studies, etc. The courses are intended to provide wider insights into the subject as a complement to the specialist competence acquired in the research work. The courses included in the individual study plan may partly be selected among courses given within the students home department, and partly among externally organised courses.

Some of the courses may be taken from the second level, provided that they have not been accounted for in the student's Master of Science. For the PhD exam courses comprising at least 90 HE credits are required, and for licentiate exam at least 60 HE credits.

The range of courses offered is revised continuously. The courses are divided into a basic part that should be common for all PhD students in the subject area and one part that is depending on the planned topic for the thesis.

Basic courses:



UPPSALA
UNIVERSITET

Theory of Science (vetenskapsteori)
Foundations of Systems Analysis
Simulation techniques
Model construction and systems identification

complementary courses:

These are intended to cover extensions of the basic methods that are of interest for the PhD student. Examples are:

Complex dynamic systems
Theory of probability and statistical theory
Linear algebra and matrix theory
Data base techniques
Computer graphics
Artificial intelligence and expert systems
Extensions of any of the basic courses specified above

In the biomechanics area:

Anatomy
Physiology
Biomechanics of the human locomotor system
Computerized image analysis

Project specific courses:

These include courses connected to specific projects, and may also imply extensions of the above topics.

Other courses:

Course in didactics for university teachers
Other courses can also be relevant, for instance in projects management, scientific methods, or entrepreneurship.

Requirements for doctoral degree

The requirements for doctoral degree consist of on one hand passed examinations in the courses included in the approved individual study plan of each doctoral student, and on other hand passed public defense of the doctoral thesis. The program leading to the doctoral degree amounts to 240 higher education credits (four years of full-time studies), of which the thesis part amounts to a minimum of 120 higher education credits and the course part to a minimum of 75 higher education credits.



UPPSALA
UNIVERSITET

Requirements for licentiate degree

A stage of at least 120 higher education credits (two years of full-time studies) in the third level program may be completed with a licentiate degree. The requirements for this are that the doctoral student both has passed the examinations included in the program stage and has got an academic paper amounting to a minimum of 60 higher education credits passed. The course part amounts to a minimum of 45 higher education credits.

Other

Further information can be obtained from www.it.uu.se (check the Division of Systems and Control).