



TEKNOLOGIE DOKTORSEXAMEN

Degree of Doctor of Philosophy (Ph.D.)

vid/at

TEKNISK NATURVETENSKAPLIG FAKULTET
Faculty of Science and Technology

Petter Holme

730806 - 0198

har blivit godkänd vid de prov som ingår i forskarutbildningen samt författat en vetenskaplig avhandling, som förklarats godkänd, efter att ha försvarats muntligen vid en offentlig disputation och har därmed i enlighet med bestämmelserna i högskoleförordningen (SFS 1993:100) fullgjort vad som fordras för doktorsexamen.

A Doctor of Philosophy has met the requirements of the Higher Education Ordinance (SFS 1993:100) regarding doctoral degrees, meaning that they have passed the examinations which are part of a graduate research programme and have completed a doctoral dissertation which has been accepted after a public defence.

Ämne/Subject

TEORETISK FYSIK med inriktning mot kondenserad material/statistisk fysik
Theoretical Physics – Condensed Matters/Statistical Physics

Avhandlingens titel/Thesis

”Form and Function of Complex Networks”

Umeå 2004-05-11

På rektors vägnar

On behalf of the Vice-Chancellor's Office

A handwritten signature in black ink, appearing to read 'Marie Wilhelmsson'.

Marie Wilhelmsson
Examenshandläggare
Degree Evaluation Officer



The Swedish Higher Education System

(The following description is approved by the National Agency for Higher Education)

General

Higher education institutions have great autonomy in the organisation of studies, use of resources and general organisation. The higher education institutions in Sweden are designated as either *universitet* or *högskola*. The status of *universitet* is awarded by the Government to higher education institutions fulfilling certain criteria. Diplomas from all higher education institutions recognised by the Government have equal official value. The same law governs all higher education institutions. Independent higher education providers may be recognised by the Government, obtain the right to award degrees and receive state subsidies. All recognised higher education is funded by the State. All programmes and major subjects are to be evaluated by the National Agency for Higher Education every six years, starting from 2001.

Grading

The Higher Education Ordinance states that the following grades can be awarded: Pass with Distinction (*väl godkänd*), Pass (*godkänd*) or Fail (*underkänd*) unless the institution decides to grade on some other scale. A number of courses use only two grades: Pass and Fail. Others, like Law and Engineering, traditionally use scales with several levels – expressed as letters or numbers. No overall grade is given for a degree and students are not ranked.

Degrees

Higher education is provided in the form of courses. These may be combined to constitute degree programmes with varying levels of individual choice. Students themselves are also able to combine different courses for the award of a degree. A course syllabus is required for each undergraduate course and a curriculum for each degree programme.

Sweden has a system of credit points (*poäng*); one week of successful full-time study is equivalent to 1 credit point. One academic year usually yields 40 credit points.

In the Degree Ordinance, the Government has laid down which degrees may be awarded and the objectives for these degrees. In the Swedish higher education system there are generally no intermediate qualifications. All degrees are regarded as final qualifications, even if there is a possibility to continue studying. Degrees are divided into general degrees and professional degrees.

General degrees

1. *Högskoleexamen* requiring a minimum of 80 credit points
2. *Kandidatexamen* requiring a minimum of 120 credit points with 60 credit points in the major subject including a thesis/degree project of 10 credit points
3. *Magisterexamen med ämnesdjup* (Master of) requiring a minimum of 160 credit points with 80 credit points in the major subject including one thesis/degree project of 20 or two thesis/degree projects of 10 credit points each
4. *Magisterexamen med ämnesbredd* (Master of) requiring a minimum of 40 credit points with specialisation including a thesis/degree project of at least 10 credit points.

A prerequisite for *Magisterexamen med ämnesbredd* is a general or professional degree of at least 120 credit points or a comparable foreign degree. *Kandidatexamen* and *Magisterexamen med ämnesdjup* may indicate the major subject or faculty, e.g. *ekonomie magisterexamen* (... of Science in Business Administration or ... of Science in Economics). The most advanced courses (at the 61-80 credit points level) for *Magisterexamen med ämnesdjup* can be accepted as partial fulfilment of the requirements for a doctoral programme.

Professional degrees

Professional degrees are awarded in the fields of engineering, health care, agriculture, law, education, the arts etc. There are around 60 professional degrees. Programmes leading to professional degrees vary in length depending on their character. Some of the professional degrees demand a previous undergraduate qualification as a prerequisite, especially within the field of health care. Institutions have to apply for the right to award professional degrees.

ACCESS AND ADMISSION TO HIGHER EDUCATION

Higher education in Sweden has two strata of eligibility: general/basic and (additional) specific requirements. The general eligibility is the same for all higher education. General eligibility is attained by completing an upper-secondary school programme and obtaining a pass grade or better in courses comprising at least 90 per cent of the credits required for the programme, or by providing proof of an equivalent level of knowledge. People who are at least 25 years old, who have been employed for four years and who have a command of English and Swedish corresponding to that obtained by completing anational upper-secondary programme are also considered to have general eligibility. The specific requirements vary according to the field of higher education and are expressed in terms of upper-secondary school qualifications in specific subjects. Restricted admission is used for all study programmes and courses.

POSTGRADUATE STUDIES

Higher education institutions with the status of *universitet* have permanent allocations of funds for research and postgraduate programmes and may award doctoral degrees, whereas at institutions designated as *högskola* these rights may be restricted to specific research areas only or they may have research links with a *universitet*.

For admission to postgraduate programmes undergraduate qualifications of at least 120 credit points are required. Furthermore, the appropriate faculty board may stipulate additional requirements for admission. Postgraduate programmes nominally comprise 160 credit points (four years of full-time study) and lead to a *doktorexamen* (PhD). A PhD student must complete a number of taught courses and write a doctoral dissertation. The dissertation must be defended at a public oral examination. A *licentiatexamen* (licentiate degree) can be obtained after a minimum of 2 years (80 credit points) and requires course work and a thesis. Normally students aim directly for a *doktorexamen* but it is also possible to take a *licentiatexamen* as an intermediate degree. All faculties can award a *licentiatexamen* or *doktorexamen*, in which the discipline is named, e.g. *teknologie licentiatexamen* (Licentiate in Technology). However a faculty of engineering, like any other, may also award a *filosofie doktorexamen* (PhD).