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GENERAL SYLLABUS

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General Syllabus for the Third-Cycle Programme in Production Technology

1. Description of the Subject

The subject of Production Technology in the field of Mechanical Engineering covers areas of expertise necessary for high performance production that is environmentally friendly, rational, economical, and safe. Research in Production Technology is divided into two specialisations: production processes and production systems, and the collaboration between these two at our university is key. The subject area is limited to Production Technology in Mechanical Engineering, as it applies to industry. The subject Production Technology comprises elements of established, traditional subjects like material and manufacturing technology within the specialisation of production processes and subjects such as measurement technology, control systems, regulating systems, and computer engineering within the production systems specialisation.

2. The Purpose and Objectives of the Programme

Upon completion of the programme, the third-cycle student should be well prepared to do continued independent, high-quality research in production technology, both in the academic as well as the business sectors. The third-cycle student should acquire good scientific competence in the broad field of applied Production Technology as well as be able to communicate research results to the surrounding community.

The demands made upon the third-cycle student working toward a doctoral degree can be found in the Higher Education Ordinance, Appendix 2 of the System of Qualifications:

The Doctoral Degree
Upon completing this third-cycle programme, which culminates in a doctoral degree, the third-cycle student should be able to:

Knowledge and Understanding

- demonstrate broad knowledge and a systematic understanding of the research field as well as in-depth and current specialist knowledge in a limited part of the research field, and
- demonstrate familiarity with the scientific method in general and with the specific research field's methods in particular.

Skills and Ability

- demonstrate the ability to do scientific analysis and synthesis as well as carry out an independent critical review and to assess new, complex phenomena, issues and situations,
- demonstrate a critical mind-set in the ability to work independently and creatively, as well as with scientific accuracy, to pose questions, identify problems, and to plan and apply appropriate methodology in carrying out research and doing other qualified tasks within given timeframes, and to review and evaluate such work,
- demonstrate the ability to make a significant contribution to the creation of knowledge through independent research and a dissertation,
- demonstrate the ability to present and discuss research and research results authoritatively in dialogue with the scientific community and society in general, and to do so orally and in writing, in both national and international contexts,
- demonstrate the ability to identify the need for more knowledge, and

– demonstrate the qualifications for contributing to societal development and supporting the learning of others in research and third-cycle studies, as well as other qualified professional contexts.

Judgement and approach
– demonstrate intellectual independence and scholarly rectitude as well as the ability to conduct an assessment of research ethics, and
– demonstrate deep insight regarding the possibilities and limitations of science, its role in society and the responsibility we have for the way it is used.

The Licentiate Degree
Upon completion of the third-cycle programme culminating in a licentiate degree, the third-cycle student should be able to:

Knowledge and Understanding
– demonstrate knowledge in and understanding of the field of research, including up-to-date expertise in a specific area of this field and in-depth knowledge of scientific method in general as well as methods specific to the area of research in particular.

Skills and Ability
– demonstrate the ability critically, independently, creatively and with scholarly precision, to identify and formulate research questions, plan and conduct a limited research project and other qualified tasks, using appropriate methods within predetermined timeframes and in this way contribute to the creation of knowledge and assessment of such work,
– demonstrate the ability to present and discuss research and research results authoritatively in dialogue with the scientific community and with society in general, and to do so with clarity, orally and in writing, in both national and international contexts, and
– demonstrate the skills required to contribute independently to research and development projects and to work independently in another capacity that requires qualifications.

Judgement and Approach
– demonstrate the ability to evaluate one's own research in terms of ethical principles,
– demonstrate insight regarding the possibilities and limitations of science, its role in society, and the responsibility we have for the way it is used, and
– demonstrate the ability to identify one's own need for more knowledge and take responsibility for one's own creation of knowledge.

3. Entry Requirements, Selection, and Admission

To be qualified for studies at the third-cycle level one must have met the general and specific entry requirements and otherwise have the necessary potential to complete the programme.

3.1 General Entry Requirements

According to the Higher Education Ordinance (SFS 1993:100), an applicant meets the general entry requirements for third-cycle courses and study programmes if they:

– have a second-cycle degree,
– have satisfied the requirements for courses comprising at least 240 HE credits, of which at least 60 credits were awarded at the second-cycle level, or
– have acquired essentially equivalent knowledge in some other way in Sweden or abroad.

For individual applicants, the Research and Education Board may, in accordance with the Higher Education Ordinance, Chapter 7, Section 39, grant exemptions from the general entry requirements if there is a particular reason.

3.2 Specific Entry Requirements

Specific entry requirements for third-cycle studies in Production Technology are met by anyone whose second-cycle degree has a focus that is related to and has relevance for the subject. Their degree can be in the field of Production Technology or a related area of technology.

Qualifications can be from Sweden or another country. Those applying from abroad whose native language is not English, Swedish, Norwegian, or Danish will usually have to take an English language test (for ex: TOEFL 575 [paper-based]/TOEFL 90 [internet-based]) before being accepted.

3.3 Selection and Admissions

Admission Regulations at University West govern how acceptance to a third-cycle programme takes place. The basis for selection among qualified applicants for third-cycle education is the ability to benefit from such a programme. The Research and Education Board are in charge of determining the basis of assessment that will apply when reviewing the ability of applicants to benefit from the programme.

The mere fact that an applicant's transcripts from previous studies or their professional/vocational activity are being considered for credit transfer does not give the applicant priority over other applicants. The Research and Education Board decide on admission to third-cycle programmes.

In addition to these general criteria for assessment stated in the Admission Regulations, there are normally some other considerations in the assessment of an applicant's ability to benefit from the programme:

- the relevance of previous qualifications to the subject, such as the applicant's first- and second-cycle degrees or the relevance of professional experience for the subject of research
- Academic degrees and experience in relevant scientific theory and methodology related to the subject of research
- the student's analytical abilities
- the student's ability to present advanced project work orally and in writing

Examples of documentation for assessment can be the applicant's choice of courses and subject(s) for degree projects during previous studies, employment as a research assistant for a research project (or similar), the methodology and analysis sections of their degree projects, and discussions relevant to the subject during the personal interview.

In addition to the evaluation of documentation included in the application, interviews should always be conducted with all the eligible applicants who are judged to be most qualified. Notes should be taken during the interviews so that they can be reviewed later on and, if necessary, supplemented with further questions for the applicants.

4. Content and Design of the Programme

The third-cycle programme in Production Technology culminates in a doctoral degree comprised of 240 HE credits, representing four years of full-time studies. During these four years, the student takes courses worth 60-90 credits and writes a dissertation worth 150-180 credits.

If the third-cycle programme in Production Technology culminates in a licentiate degree, which is comprised of 120 HE credits, representing two years of full-time studies. During these two years, the student takes courses worth 30-45 credits and writes a thesis worth 75-90 credits.

4.1 Courses

The third-cycle student selects an appropriate combination of courses in consultation with their supervisors. Both depth and breadth should be the goal. Breadth is achieved through compulsory courses in the subject. Depth is achieved through specialisation in a narrower area by choosing elective courses. The fact that the subject is an applied science, there is great emphasis placed on the student's own research project.

Compulsory courses
A degree in the subject area includes 30 HE credits of compulsory courses. Students doing the licentiate degree are required to complete the first four of the following compulsory courses:

- K0004176, 2.5 HE credits (must be taken by all third-cycle students at University West)
- The Philosophy of Science and Research Ethics, 5 HE credits (must be taken by all third-cycle students at University West)
- Scientific Research Methodology, Planning Experiments and Publication Techniques, 7.5 HE credits
- Production Technology, 7.5 hp
- The Future of Production, 7.5 hp

Other courses that are included in each degree are elective and chosen in consultation with the supervisors. Which optional courses are offered depends upon the third-cycle student's wishes. Elective courses can also be taken at other universities or as individual reading courses.

4.2 The Individual Study Plan

Each third-cycle student should have an individual study plan that is revised and approved at least once a year.

4.3 The Programme Design

A normal course of studies is two years for the licentiate degree and four years for the doctoral degree. If the third-cycle student is accepted for the latter half of the programme (after the licentiate degree), the normal course of studies for a doctoral student takes two years.
The principal supervisor, together with the other supervisor(s), is responsible for the third-cycle student's general progress in their dissertation work. In addition to regular supervision, there should also be continuous follow-up conversations about the general progress that the third-cycle student is making.

To ensure a good start on the dissertation, the doctoral student holds a public seminar, at which time the design, research questions, methodological approaches, and a plan for execution are presented and discussed. The planning seminar is usually held within twelve months of admission to the third-cycle programme.

As support for the third-cycle student's continued progress, halfway through their course of studies the doctoral student holds a public seminar at which time they present their dissertation work and discuss it in its entirety. The material for this seminar includes published articles, the planned manuscript, ongoing research, as well as an outline covering continued planning for the public defence.

If the third-cycle student wishes to do a licentiate degree, the mid-way review is replaced by a public seminar called the final review, at which time their work, as it is intended to be published (monograph or compilation thesis, including the introductory chapter), is presented and discussed.

Before the public defence, the doctoral student holds a final review that is open to the public, at which time the dissertation, as it is intended to be published (as a monograph or a compilation thesis, including the introductory chapter) is presented and discussed.

The final review prior to the licentiate seminar and the final review prior to the public defence are intended as support for the third-cycle student in that there will be detailed discussions and space for constructive criticism before the student finalises the thesis/dissertation manuscript and applies for a licentiate seminar/public defence.

We recommend that the third-cycle student get work experience in other departments. The goal is that this experience will comprise about 20 percent of their work, which means that the total course of studies is extended by that amount of time.

5. The Dissertation, Thesis, and Degree

The Doctoral Degree
To obtain a PhD, the third-cycle student must have completed the 240-credit programme, which represents four years of full-time studies. The national qualitative targets in the Higher Education Ordinance are achieved by taking courses writing a dissertation, and other activities, following an individual study plan. In addition, the third-cycle student should:

- have received a passing grade on their scholarly dissertation after presenting and defending it orally in a public defence (see below). The dissertation can contain material from an earlier licentiate thesis. The dissertation can be a monograph or a compilation thesis. It can be written in Swedish, English, Norwegian, or Danish. If the dissertation is written in English, there must be a Swedish, Norwegian, or Danish title and summary. If the dissertation is written in Swedish, there must be an English title and summary.
- if the dissertation is a compilation thesis, it should normally contain at least four articles that have been published or are publishable in scientific journals and/or presented at conferences that have a peer review process and relevance for the field of research. It should also have an introductory chapter.

The defence is open to the public and should be announced at least 15 working days prior to the event. The Research and Education Board appoint an external reviewer who reviews the dissertation. They also appoint an examining committee consisting of three examiners and a substitute. The defence is chaired by one of the members of the Research and Education Board, who is specifically appointed to be the Chairperson. The examining committee passes or fails the dissertation and its defence, delivering their assessment in a specific protocol. See further information in 'Rules and Guidelines for Third-Cycle Programmes'.

The degree obtained is Doctor of Philosophy in Production Technology.

The Licentiate Degree
To obtain a PhD, the third-cycle student must have completed the 120-credit programme (courses and thesis as outlined above), which represents two years of full-time studies. The national qualitative targets in the

Higher Education Ordinance are achieved by taking courses writing a thesis, and other activities, following an individual study plan. In addition, the third-cycle student should:

- have received a passing grade on their scholarly licentiate thesis after presenting and defending it orally in a public seminar (see below). The thesis can be a monograph or a compilation thesis. It can be written in Swedish, English, Norwegian, or Danish. If the thesis is written in English, there must be a Swedish, Norwegian, or Danish title and summary. If the dissertation is written in Swedish, there must be an English title and summary.

- If the thesis is a compilation thesis, it should normally contain at least two articles that have been published or are publishable in scientific journals and/or presented at conferences that have a peer review process and relevance for the field of research. It should also have an introductory chapter.

The defence is open to the public and should be announced at least 15 working days prior to the event. The Research and Education Board appoint a reviewer who reviews the thesis. They also appoint an examiner, who also chairs the seminar. The examiner passes or fails the thesis and its defence, delivering their assessment in a specific protocol. See further information in 'Rules and Guidelines for Third-Cycle Programmes'.

The degree obtained is Licentiate of Engineering in Production Technology.

5.1 Grades

The grading scale for dissertations, licentiate theses, and courses at the third-cycle level is Pass/Fail.

6. Interim Regulations

The third-cycle student who has been admitted to the programme before the General Syllabus was validated can, in consultation with their principal supervisor and the Director of Studies, request to switch to the General Syllabus. This change must be documented in the individual study plan.