General syllabus for the doctoral programme in the subject of:

TECHNOLOGY

Valid from 1 April 2019

Department to which the study plan applies	Subject code:
ENERGY AND TECHNOLOGY	NJTEKN00

The objectives and design of courses in this subject may vary between faculties (see point 3. Miscellaneous).

Technology (“teknologi”) denotes sciences concerning methods for the utilisation of various resources and the resulting effects. The third-cycle subject area technology focuses on systems, technology and methods within natural resources and the agricultural sector for utilisation of ecosystem resources. The subject is delimited from basic sciences by focusing on the utilisation of knowledge generated from basic sciences to build production systems where control of labour, energy and material flows, and efficient organisation are important components.

Regulations for third-cycle (doctoral) education at SLU

Third-cycle (doctoral) education is regulated by the Higher Education Ordinance (SFS 1993:100) and the Ordinance for the Swedish University of Agricultural Sciences (SFS 1993:221).

In addition, SLU has regulations for the following:

- recruitment and admission, in Admission regulations for third-cycle (doctoral) education, (SLUID: 2018.1.1.1-930)
- joint programmes leading to a double or joint degree
- supervision
- scope and content of programmes
- planning and follow-up of programmes
- procedure when a course or study programme is unsatisfactory
- examination
- degrees.

These can be found in Guidelines for third-cycle (doctoral) education (SLUID: 2018.1.1.1-4677).

A general syllabus must indicate the following: the main content of the programme, specific entry requirements and any other regulations required. All general syllabuses must be approved by the faculty board.

The programme is organised in a way that allows doctoral students to meet the qualitative targets for third-cycle courses and programmes specified in the *Higher Education Ordinance's Annex 2 – Qualifications Ordinance*:

Qualitative targets according to the Qualifications Ordinance: Degree of Doctor

Outcomes
For the Degree of Doctor the third-cycle student shall

Knowledge and understanding

- *demonstrate broad knowledge and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in a limited area of this field, and*
- *demonstrate familiarity with research methodology in general and the methods of the specific field of research in particular.*

Competence and skills

- *demonstrate the capacity for scholarly analysis and synthesis as well to review and assess new and complex phenomena, issues and situations autonomously and critically;*
- *demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work;*
- *demonstrate through a dissertation the ability to make a significant contribution to the formation of knowledge through his or her own research;*
- *demonstrate the ability in both national and international contexts to present and discuss research and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general;*
- *demonstrate the ability to identify the need for further knowledge and*
- *demonstrate the capacity to contribute to social development and support the learning of others both through research and education and in some other qualified professional capacity.*

Judgement and approach

- *demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to make assessments of research ethics, and*
- *demonstrate specialised insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used.*

Outcomes
For a Degree of Licentiate the third-cycle student shall

Knowledge and understanding

- *demonstrate knowledge and understanding in the field of research including current specialist knowledge in a limited area of this field as well as specialised knowledge of research methodology in general and the methods of the specific field of research in particular.*

Competence and skills

- *demonstrate the ability to identify and formulate issues with scholarly precision critically, autonomously and creatively, and to plan and use appropriate methods to undertake a limited piece of research and other qualified tasks within predetermined time frames in order to contribute to the formation of knowledge as well as to evaluate this work;*
- *demonstrate the ability in both national and international contexts to present and discuss research and research findings in speech and writing and in dialogue with the academic community and society in general, and*
- *demonstrate the proficiency required to participate autonomously in research and development work and to work autonomously in some other qualified capacity.*

Judgement and approach

- *demonstrate the ability to make assessments of ethical aspects of his or her own research;*
- *demonstrate insight into the possibilities and limitations of research, its role in society and the responsibility of the individual for how it is used, and*
- *demonstrate the ability to identify the personal need for further knowledge and take responsibility for his or her ongoing learning.*

1. Programme content and scope

The programme contains two main elements: research and coursework.

Research

The student should conduct independent research work to be presented in a compilation thesis written in English.

Courses

The student is required to undertake coursework which corresponds to 30–60 higher education credits (HEC) for a Degree of Doctor or 15–30 HEC for a Degree of Licentiate. This must include suitable general courses as well as elective subject courses.

2. Specific entry requirements

Those admitted must meet the following specific entry requirements.

The special entry requirement for the subject technology is the equivalent of at least 90 HEC in courses relevant to technology. At least 30 HEC must be at second-cycle level. For applicants who do not fulfill these criteria, eligibility is verified on a case-by-case basis taking into account the intended research task.

3. Miscellaneous

Each respective faculty to which the third-cycle subject area is linked can choose to specify specialisations or requirements in addition to the general study plan. These requirements must be documented in an appendix.

4. Appendexes

Appendix 1 – Faculty of Natural Resources and Agricultural Sciences, faculty-specific requirements

APPENDIX 1

Specific requirements at the Faculty of Natural Resources and Agricultural Sciences

Research:

The compilation thesis for a Degree of Doctor must comprise at least four papers, one of which must have been published or accepted for publication in a scientific journal and have the doctoral student as the corresponding author. All papers must be of publishable quality.

The compilation thesis for a Degree of Licentiate must comprise at least two papers, and the student must be the corresponding author of one of them. All papers must be of publishable quality.

Courses:

The student is required to undertake coursework which corresponds to 40–60 HEC for a Degree of Doctor, or 20–30 HEC for a Degree of Licentiate.

According to the current guidelines for doctoral education (SLU ua 2018.1.1.1-4677), all doctoral and licentiate degrees at SLU must include credit awarding courses of philosophy of science and research ethics at PhD-level. These courses should also cover rules on cheating and plagiarism.

Introductory paper:

Each new doctoral student must write a short introductory essay of 4–6 pages within their subject during the first 6 months of their doctoral studies.

Environment:

When drafting the individual study plan, the doctoral student, together with the supervisor, should take into consideration the procedure for doctoral studies at the MVM (doc. no SLU-278) in order to strengthen the environmental aspect of doctoral studies at the Department of Energy and Technology.