General syllabus for third-cycle programme in Resource Recovery

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This is a translation of the Swedish original, legal document.

1. Subject description

Resource recovery as a research area comprises the development of technical methods for recovering resources, energy and materials from waste or residual products, as well as the development of materials to improve recyclability.

In addition to technical methods, the area also includes research on social aspects related to societal solutions for resource recovery.

Research in resource recovery aims to promote development towards a sustainable society.

1.1. Organisation

The Research and Education Board has established research education committees with the possibility of delegation. For a description of the organisation of the committees, please refer to the Organisation and Decision-Making Rules for Research Education Committees.

There shall be a Director of Studies who is scientifically competent and who is responsible, among other things, for the course offering and follow-up of individual study plans (see below).

2. Intended learning outcomes

The aim of the programme is to develop the knowledge and skills required to independently conduct research in resource recovery and to contribute to the development of knowledge within the subject through a scholarly thesis.

Third-cycle education in resource recovery shall develop the doctoral student's communicative and pedagogical skills in terms of expressing themselves well orally and in writing before academia, industry and society. The doctoral student shall also have acquired knowledge of the planning, management and implementation of research projects.

The programme shall also provide opportunities for international contacts, for example through participation in research conferences and/or stays at a higher education institution abroad.

Knowledge and understanding

For the degree of Doctor, the doctoral student shall

- 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 the research field, and

- demonstrate familiarity with research methodology in general and with the methods of the specific research field in particular.

For the degree of Licentiate, the doctoral student shall

- demonstrate knowledge and understanding in the research field, including up-to-date specialised knowledge in a limited area of the field, as well as advanced knowledge of research methodology in general and of the methods of the specific research field in particular.

Competence and skills

For the degree of Doctor, the doctoral student shall

- demonstrate the capacity for scholarly analysis and synthesis as well as for independent critical review and assessment of new and complex phenomena, issues and situations,
- demonstrate the ability to identify and formulate research questions critically, independently, creatively and with scholarly rigour, and to plan and, using appropriate methods, conduct research and other qualified tasks within given time frames, and to review and evaluate such work,
- demonstrate through a thesis the ability to make a significant contribution to the development of knowledge through their own research,
- demonstrate the ability, in both national and international contexts, to present and discuss research and research findings authoritatively in speech and writing, in dialogue with the research community and society in general,
- demonstrate the ability to identify the need for further knowledge, and
- demonstrate the capacity to contribute to societal development and support the learning of others, both in research and education and in other qualified professional contexts.

For the degree of Licentiate, the doctoral student shall

- demonstrate the ability to identify and formulate research questions critically, independently and creatively, and with scholarly rigour, to plan and, using appropriate methods, carry out a limited research project and other qualified tasks within given time frames and thereby contribute to the development 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 clearly in speech and writing, in dialogue with the research community and society in general, and
- demonstrate the skills required to participate independently in research and development work and to work independently in other qualified activities.

Judgement and approach

For the degree of Doctor, the doctoral student shall

- demonstrate intellectual independence and research integrity as well as the ability to make research ethics assessments,
- demonstrate deeper insight into the possibilities and limitations of science, its role in society and people's responsibility for how it is used.

For the degree of Licentiate, the doctoral student shall

- demonstrate the ability to make research ethics assessments in their own research,
- demonstrate insight into the possibilities and limitations of science, its role in society and people's responsibility for how it is used, and
- demonstrate the ability to identify their need for further knowledge and to take responsibility for their development of knowledge.

3. Structure and organisation of the programme

3.1. Overview

The third-cycle programme in Resource Recovery lead to the Degree of Doctor (240 credits) or to the Degree of Licentiate (120 credits). A Degree of Licentiate may constitute an intermediate qualification towards a Degree of Doctor.

Third-cycle programmes consist partly of courses, which are assessed successively, and partly of an independent research project that shall lead to a scholarly thesis. For a Degree of Doctor, the courses shall comprise 60 credits and the thesis 180 credits. The doctoral thesis shall be defended at a public defence. For a Degree of Licentiate, the courses shall comprise 30 credits and the thesis 90 credits. The licentiate thesis shall be presented at a public seminar.

3.2. Supervisors and examiner

For each doctoral student, the Research and Education Board, or the committee established by the Board for this purpose, appoints, on the proposal of the Director of Studies, at least two supervisors, one of whom shall be the principal supervisor and the others assistant supervisors, as well as an examiner.

The principal supervisor shall have qualifications at least equivalent to those required for appointment as a docent and shall have completed training in supervision. Assistant supervisors shall have been awarded a degree of Doctor. All supervisors shall be well acquainted with the area of the thesis. The examiner shall be a professor and employed at the University of Borås. The examiner shall have several years' experience of research in the area of Resource Recovery or in closely related research areas. The examiner shall have sound knowledge of the area, its focus and its delimitations. Examiners within Resource Recovery have joint responsibility for the development of the third-cycle subject area.

The principal supervisor has primary responsibility for guidance and advice within the framework of third-cycle education. The principal supervisor is also responsible for ensuring that the doctoral student receives sufficient supervision. Assistant supervisors participate in the supervision of the doctoral student.

The examiner has overall responsibility for the doctoral student's third-cycle education and shall ensure that the programme meets the quality requirements regarding the research task and other components. The examiner shall approve the individual study plan and participate in study follow-up. The examiner shall also conduct a preliminary review of the licentiate thesis or doctoral thesis, respectively. The examiner approves the licentiate thesis and its presentation.

The principal supervisor and examiner may not be one and the same person. If needed for the degree of Licentiate, the Research and Education Board, or the committee established by the Board for this purpose, appoints an external reviewer who submits a written statement regarding the licentiate thesis.

3.3. Individual study plan

An individual study plan shall be established for each doctoral student in connection with admission. The individual study plan shall include the subject of the thesis, the names of the supervisors and examiner, a timetable for the third-cycle education, a plan for financing the third-cycle education, departmental duties and teaching, a project plan for the thesis work, and planned courses.

Each year, a follow-up meeting shall be held with the doctoral student, Director of Studies, examiner, principal supervisor and assistant supervisors. At the meeting, the doctoral student's progress in both courses and research and thesis work shall be reviewed and the individual study plan updated. In the event of major deviations from the study plan, an additional follow-up meeting shall be held and the study plan updated.

The Director of Studies is responsible for establishing, updating and following up the individual study plan. The individual study plan is signed by the doctoral student, supervisors, examiner and Director of Studies. The individual study plan and its updates are approved by the Research and Education Board or the committee established by the Board for this purpose.

3.4. Mid-way seminar

An important component of third-cycle education is that the doctoral student is given the opportunity to practise the ability to compile, analyse, present and discuss their research findings with other researchers. This should preferably take place continuously throughout the programme, but on one occasion before the public defence it shall take place in a more formalised form, a so-called mid-way seminar. This applies in cases where a degree of Licentiate is not an intermediate qualification towards a degree of Doctor.

The seminar is planned in the doctoral student's individual study plan and is held after half of the study period. A discussion leader who is not involved in the doctoral student's thesis work is appointed to review the doctoral student's thesis work and lead the discussion during the seminar.

The mid-way seminar is an opportunity for the doctoral student to present their findings and discuss them, as well as future planned projects, with a group of researchers and doctoral students who have knowledge and interest in the subject area. The seminar documentation consists of both published and unpublished material as well as continued planning of the thesis work leading up to the public defence.

The principal supervisor is responsible for the implementation of the mid-way seminar.

3.5. Thesis

The thesis may consist either of a single, coherent scholarly work (monograph thesis) or of a compilation of scholarly articles with a summarising introduction or covering essay (compilation thesis). The doctoral student may have authored the scholarly articles alone or jointly with others. The majority of the scholarly articles shall have been published or accepted for publication in scholarly journals, and the doctoral student's contribution shall be distinguishable and independent.

3.6. Courses

For the Degree of Licentiate, the course component comprises 30 credits, and for the Degree of Doctor, 60 credits. Courses included in the Degree of Licentiate may be included in these 60 credits. Each course has an examiner.

Relevant courses from first-cycle or second-cycle education may be credited within third-cycle education. A maximum of 15 credits in third-cycle education may have been acquired before the start of the third-cycle studies within the framework of completed first-cycle or second-cycle education. This applies to doctoral students admitted with at least 270 credits from their previous education. Doctoral students admitted with a first-cycle qualification comprising 240 credits may not transfer any credits from first-cycle or second-cycle education, and a gradual transition applies between the 240-credit and 270-credit levels. Within these limits, however, the examiner determines how many and which credits from first-cycle or second-cycle education may be credited.

The following courses are compulsory for the degree of Doctor in Resource Recovery (exemptions may be granted by the examiner following a special application and after consultation with the principal supervisor):

- Introductory course in the area of Resource Recovery, at least 5 credits.
- Relevant methodology courses comprising at least 7.5 credits.
- Course in theory of science, at least 5 credits.
- Course in research ethics, at least 2.5 credits.
- Courses in the areas of information retrieval, oral and written presentation, and teaching and learning in higher education, comprising a total of at least 5 credits.

The following courses are compulsory for the degree of Licentiate in Resource Recovery (exemptions may be granted by the examiner following a special application and after consultation with the principal supervisor):

- Introductory course in the area of Resource Recovery, at least 5 credits.
- Relevant methodology courses comprising at least 7.5 credits.
- Course in research ethics, at least 2.5 credits.
- Courses in the areas of information retrieval, oral and written presentation, and teaching and learning in higher education, comprising a total of at least 2.5 credits.

Other courses are approved by the examiner, after consultation with the doctoral student and the supervisors, and are recorded in the doctoral student's individual study plan. Both courses offered at the University of Borås and courses at other higher education institutions may be considered.

4. Entry requirements, selection and admission

4.1. General entry requirements

A person meets the general entry requirements for admission to third-cycle education if they have:

1. been awarded a second-cycle qualification,
2. satisfied the requirements for courses comprising at least 240 credits, of which at least 60 credits were awarded in the second cycle, or
3. acquired substantially equivalent knowledge in some other way in Sweden or abroad.

4.2. Specific entry requirements

For admission to third-cycle education in Resource Recovery, the student is required to hold a second-cycle qualification, or equivalent, with sufficient relevance to the third-cycle subject area Resource Recovery. The student shall also have knowledge of English equivalent to Swedish upper-secondary school level. Further regulations are issued by the University's Admissions Office. The proposed principal supervisor assesses whether the applicant has the ability required to complete the third-cycle education.

4.3. Selection and admission

Only the number of doctoral students who can be offered acceptable conditions regarding supervision and other conditions of study may be admitted to third-cycle education. Funding for each doctoral student shall guarantee four years of full-time third-cycle studies or the equivalent. Under the Higher Education Ordinance, only students who intend to pursue their third-cycle studies at a study activity rate of at least 50 per cent may be admitted to third-cycle education.

Admission to third-cycle education takes place in connection with an advertised doctoral studentship at the University of Borås or if there are agreements on other legitimate means for study funding.

The Research and Education Board, or the committee established by the Board for this purpose, appoints a ranking group that prepares the matter and draws up a ranking record. This record shall include the selection criteria and an assessment of how well the different applicants meet them.

Selection among applicants is based on their ability to benefit from the programme.

The Research and Education Board, or the committee established by the Board for this purpose, decides on admission to third-cycle education following a proposal from the ranking group.

For further information about admission and employment, see the University's admission regulations and appointments procedure, respectively.

5. Examination

Within the third-cycle programme in Resource Recovery, there are four different qualifications:

- Degree of Doctor of Philosophy in Science in Resource Recovery, 240 credits.
- Degree of Doctor of Philosophy in Resource Recovery, 240 credits.
- Degree of Licentiate of Philosophy in Science in Resource Recovery, 120 credits.
- Degree of Licentiate of Philosophy in Resource Recovery, 120 credits.

The decision on the degree designation is made when the individual study plan is approved. The following assessment criteria apply when choosing the designation:

- the doctoral student's first-cycle/second-cycle qualification
- the supervisor's area of expertise
- the specialisation of the licentiate thesis/doctoral thesis

For the Degree of Doctor, the following are required:

- Courses comprising 60 credits
- A thesis comprising 180 credits, in the form of a monograph thesis or a compilation thesis, defended at a public defence.

In the case of a monograph thesis, the thesis shall have been reviewed by two persons qualified for appointment as supervisors (so-called green reading) before it may be submitted for public defence. These persons may not be the doctoral student's examiner or supervisors.

In the case of a compilation thesis, the scholarly articles shall be of such quality that they can be published in scholarly journals, and the doctoral student's contribution shall be distinguishable and independent. Normally, at least four articles shall be included in the thesis. At least half of the articles shall have been published or accepted for publication in scholarly journals at the time of the public defence. If this is not the case, the thesis shall have been reviewed by two persons qualified for appointment as supervisors (so-called green reading) before it may be submitted for public defence. These persons may not be the doctoral student's examiner or supervisors.

A final seminar, at which the thesis is reviewed and discussed in its entirety, shall be held well in advance of the planned public defence date. The principal supervisor is responsible for the implementation of the final seminar.

At the public defence, a person qualified for appointment as a supervisor, appointed by the Research and Education Board or the committee established by the Board for this purpose, participates as the external reviewer. The external reviewer shall not be employed at the University of Borås.

The doctoral thesis is graded as Pass (G) or Fail (U). The grade is decided by an examining committee. The examining committee is appointed by the Research and Education Board, or the committee established by the Board for this purpose, and shall consist of three or five members. The members may not be employed at the University of Borås unless there are special reasons. However, a deputy member may come from the University of Borås. As a rule, the members of the examining committee shall have qualifications at least equivalent to those required for appointment as a docent.

Further provisions concerning the composition of the examining committee are set out in the University's guidelines for public defences.

For the Degree of Licentiate, the following are required:

- Courses comprising 30 credits
- A thesis comprising 90 credits, in the form of a monograph thesis or compilation thesis, defended at a public seminar.

In the case of a monograph thesis, the thesis shall have been reviewed by a person qualified for appointment as a supervisor (so-called green reading) before it may be submitted for seminar presentation. This person may not be the doctoral student's examiner or supervisor.

In the case of a compilation thesis, the scholarly articles shall be of such quality that they can be published in scholarly journals, and the doctoral student's contribution shall be distinguishable and independent. Normally, at least two articles shall be included in the thesis. At least half of the articles shall have been published or accepted for publication in scholarly journals at the time of the seminar. If this is not the case, the thesis shall have been reviewed by a person qualified for appointment as a supervisor (so-called green reading) before it may be submitted for seminar presentation. This person may not be the doctoral student's examiner or supervisor.

At the licentiate seminar, a person qualified for appointment as a supervisor, appointed by the Research and Education Board or the committee established by the Board for this purpose, participates as discussion leader.

The licentiate thesis is graded as Pass (G) or Fail (U). The grade is decided by the examiner.

For further information about examination, see the University's local degree ordinance.

6. Entry into force and transitional provisions

The previous general syllabus (Reg. no. 421-24) ceases to apply to doctoral students admitted to the third-cycle programme after 2026-08-27. Following agreement between the doctoral student and supervisor, this general syllabus may constitute the governing document for doctoral students who have already been admitted. The doctoral student's individual study plan shall state which general syllabus the doctoral student follows.

7. Other provisions

In other respects, the general provisions for third-cycle programmes adopted by the University of Borås apply; these regulate matters such as employment, approved leave from studies and general rights for doctoral students. Current regulations are available at www.hb.se.