



Biomedical Science

General Syllabus for Postgraduate Research Training

Programme in Biomedical Science

The syllabus was approved by the Faculty Board, Faculty of Health and Society, Malmö University on 15th October 2009.

1. Description of the subject and contents

Biomedical science is a multidisciplinary subject, drawing on chemistry, physics, human biology and medicine. Within biomedical science, theoretical and applied science is combined to provide applications in areas such as medical diagnosis and treatment. The subject also involves taking into account relevant academic, societal and ethical deliberations based on an holistic view of the human being. Biomedical science incorporates biomedical laboratory science and biomedical technology.

Biomedical laboratory science focuses on the development of methods that are used in laboratory medicine and in the investigation of biological functions. Biomedical technology supports the development of products and technology within the biomedical field.

In biomedical science, medical and biological processes are studied on micro, nano and molecular levels. Studies of phenomena and processes at biological interfaces are central to the field, and emphasize the importance of the association of surface chemistry, biology, and medicine.

2. Aims of the PhD research training programme

Postgraduate research training is intended to provide advanced knowledge and skills in the subject of biomedical science. The aim is to train scientists with advanced knowledge in theory and research methodology and to provide them with the ability to solve problems independently and to assess critically and independently the results obtained.

The programme is intended to ensure that students are well prepared for independent research tasks or other comparable duties.

Knowledge and understanding

To obtain a PhD, postgraduate students should

- demonstrate advanced knowledge in and a systematic understanding of the research field. Postgraduate students should also have an advanced and up-to-date specialist knowledge in a well-defined area of the research field and
- demonstrate familiarity with scholarly methods in general and with methods in the specific field of research in particular.

Skills and ability

To obtain a PhD postgraduate students should

- demonstrate an ability to engage in scholarly analysis and synthesis and in an independent, critical examination and assessment of new and complex phenomena, issues and situations;
- demonstrate an ability to identify and formulate issues in a critical, independent and creative manner, and proceeding with scientific precision, to plan and using appropriate methods, conduct research and other advanced tasks within specified time limits and to scrutinise and evaluate such work;
- demonstrate, in a dissertation, their ability to make a substantial contribution to the development of knowledge through their own research;
- demonstrate an ability to present and discuss research and research results with authority, in dialogue with the scholarly community and society in general, orally and in writing, in both national and international contexts;
- demonstrate an ability to identify their need of further knowledge; and
- demonstrate a potential to contribute to the development of society and support other people's learning, both in the field of research and education and in other advanced professional contexts.

Judgement and approach

To obtain a PhD postgraduate students should

- demonstrate intellectual independence and scholarly integrity and an ability to make ethical assessments relating to research; and
- demonstrate deeper insight into the potential and limitations of scholarship, its role in society and people's responsibility for how it is used.

Aims for a licentiate degree

Knowledge and understanding

To obtain a licentiate degree postgraduate students should

- demonstrate knowledge in and an understanding of the research field. Postgraduate students should also have an advanced and up-to-date specialist knowledge in a defined part of the research field, and
- demonstrate familiarity with scholarly methods in general and with methods in the specific field of research in particular.

Skills and ability

To obtain a licentiate degree postgraduate students should

- demonstrate an ability to identify and formulate issues critically, independently and creatively, and proceeding with scientific precision, to plan and, using appropriate

methods, conduct research and other advanced tasks within specified time limits, and to scrutinise and evaluate such work;

- demonstrate an ability to present and discuss research and research results with clarity, in dialogue with the scholarly community and society in general, orally and in writing, in both national and international contexts;

- demonstrate the skills necessary in order to independently participate in research and development and independently work in other advanced functions.

Judgement and approach

To obtain a licentiate degree postgraduate students must

- demonstrate an ability to present and discuss research and research results with clarity, in dialogue with the scholarly community and society in general, orally and in writing, in both national and international contexts;

- demonstrate the skills necessary in order to independently participate in research and development and independently work in other advanced functions.

3. Entry requirements for PhD research programmes

General entry requirements for PhD research programmes involve:

1. Successful completion of appropriate degree at advanced level
2. Completion of a degree programme totalling at least 240 higher education credits, of which 60 credits should be completed at advanced level, or
3. Having equivalent knowledge acquired inside or outside Sweden.

Specific entry requirements

Specific entry requirements are the successful completion of 90 higher education credits, of which 30 credits are at an advanced level, in a subject of relevance for the current research field or equivalent knowledge acquired in some other way. Adequate knowledge in English is also required.

Students that have the required knowledge as set out below before 1st of July, 2007, are eligible for admittance to postgraduate research training up until the end of June, 2015 (transition regulations SFS 2006:1053 p 11):

- Bachelor's degree comprising at least 120 credits or equivalent knowledge acquired inside or outside Sweden.
- Specific entry requirements are the successful completion of 90 higher education credits, of which 30 credits are at an advanced level, in a subject of relevance for the current research field or equivalent knowledge acquired in some other way. Adequate knowledge in English is also required.

4. Basis for Admissions Assessment

In the assessment of applicants for admission to postgraduate education, the ability to benefit from the research training programme is used as suitable criteria. To assess this ability, previous study results, essays, term papers, reports, research plans, any research qualifications and documented work experience are taken into consideration. Special importance is attached to independent work at first (undergraduate) and advanced levels.

Previous education or vocational experience which has been accredited will not give the applicant in cases of selection priority over other applicants.

In active recruitment and selection of students for postgraduate research training, consideration will be made to equal opportunities.

When applying for admission on the basis of alternative funding, the funding should allow studies to be followed at least 50% of a full-time working week during the entire postgraduate research training programme. In addition the following aspects should be taken into account:

- Entry requirements
- Ability to benefit from postgraduate research training programme
- Project plan and its relevance for the research of the faculty
- Access to tutorials

5. Organization of the research training programme

Admission to the postgraduate research training programme is made for four years of full-time studies (240 higher education credits), leading to the award of a PhD. In special circumstances admission can be made for two years of full-time studies (120 higher education credits) leading to a licentiate degree. A postgraduate student has the right, but is not under any obligation, to take a licentiate degree as this stage in the research training programme.

Requirements for a Licentiate degree

- Successfully completed courses, 30 higher education credits
- Successfully completed scientific paper, 90 higher education credits

Requirements for a PhD

- Successfully completed, 60 credits
- Successfully completed dissertation, 180 credits

Courses

The courses within the degree programme consist of courses at the Faculty of Health and Society, courses at other faculties at Malmö University, joint university courses (with admission for postgraduate students at Malmö University), courses held within the framework of national research schools, and courses at other universities abroad and in Sweden. The choice of courses must be agreed in advance by the supervisor.

The courses should be a combination of the following, see below, comprising a total of 60 credits for a PhD and 30 credits for a licentiate degree:

Theory and method courses, minimum 26 higher education credits for PhD; minimum 10 credits for a licentiate degree

This includes courses in the theory and methodology of science and other theory courses that are of relevance for the biomedical science research field and courses in scientific method focusing on quantitative data collection and analysis. Some of the courses can be chosen from the range of courses on offer at Malmö University. Within biomedical science, the courses in laboratory methodology 1 and 2 are recommended. In this part, a maximum of 10 credits is allowed to involve reading courses with a syllabus (maximum 5 credits for a licentiate degree).

Subject courses, minimum 26 credits for PhD, minimum 10 credits for licentiate

Courses in this part of the programme should be of relevance to the research area of biomedical science. The direct preparation and study for the dissertation is not included in this part. It will be included in the 180 higher education credits that are given for the dissertation, see below.

Courses in higher education pedagogy, 3 higher education credits for PhD

Licentiate paper and dissertation

The postgraduate student must write an academic dissertation. In the dissertation the student should present and summarize his or her research in an independent and scientifically satisfactory way.

The dissertation can be written as a compilation of individual scientific papers/articles together with an accompanying framework summary. For a dissertation a minimum of four articles is required, of which a minimum of two should have been accepted for publication in a scientific journal with peer-review. For a licentiate degree, two articles are required, of which a minimum of one should have been accepted for publication. Alternatively the dissertation can be written as a single coherent academic text (monograph). In the dissertation the research student's contribution should be clearly distinguishable if the work has been carried out as a team. A dissertation should contain a section that analyzes the need for further knowledge and research within the research field.

During the dissertation writing work the postgraduate student should actively take part in the postgraduate seminars that are arranged by the faculty. The student is not given separate credits for the seminars as they are included in the 180 higher education credits of the dissertation (for licentiate, 90 credits). In the dissertation work participation in the research activities outside Malmö University is also included. This is mainly done by participation in conferences, workshops and the like. Postgraduate students are encouraged to spend time with research teams at other universities, if this is deemed relevant and beneficial for the dissertation.

Individual syllabus

Before admission to the postgraduate research training programme an individual syllabus for the postgraduate student must be drawn up in cooperation with the supervisor. The syllabus states how the programme is going to be organised regarding courses and the writing of the dissertation. The syllabus must be reviewed by the research student and the supervisor together once a year.

A postgraduate student who, in addition to being eligible for the postgraduate research training programme, has successfully completed a degree at advanced level, or equivalent can be credited for courses within the postgraduate research training programme if the examiner, after review, assesses that the previous degree can be accepted for accreditation. Accreditation must be reviewed if a student requests it.

6. Examination and monitoring of progression

In the Faculty of Health and Society, progression must be shown in the revised individual syllabus to be reviewed annually and approved by supervisor colleagues and the contact person for the postgraduate degree training programme.

The research student must give an official seminar when half of the study time has passed, at the latest. The aim is for the student to demonstrate his or her ability to present and discuss the research in a qualified way. A minimum of one PhD examiner with knowledge of the subject is appointed by the main supervisor.

All dissertations at the Faculty of Health and Society must be previewed before a decision is taken about the dissertation defence and the date for this defence. A final seminar will be held by candidates who have submitted a PhD dissertation in the form of a monograph.

The postgraduate student's participation in seminars and conferences must be documented and related to the goals / objectives of the programme when notification is made of a forthcoming licentiate seminar or PhD defence.

The courses that are included in the programme are examined in accordance with set syllabi.

Degree titles

Postgraduate research training programmes lead to the award of a doctorate or a licentiate degree. A research student is also entitled, but not obliged, to take a licentiate as an intermediate stage in the postgraduate education.

The Vice-Chancellor has agreed on following degree titles:

- Licentiat i medicinsk vetenskap - Licentiate Degree in Medical Science
- Doktor i medicinsk vetenskap - Doctor of Philosophy (PhD)

After review by the Dean, the following degree titles can also be awarded for postgraduate students depending on the relevant undergraduate degree:

- Filosofie licentiate - Licentiate of Philosophy
- Filosofie doktor - Doctor of Philosophy (PhD)
- Teknologie doktor - Doctor of Philosophy (PhD)
- Medicine doktor - Doctor of Philosophy (PhD)