



General syllabus for doctoral studies in medical science

leading to a Degree of Doctor

General syllabus for doctoral studies in medical science

Scope: 240 credits **Degree:** Degree of
Doctor **Level:** Doctoral

Established: Syllabus established by the Faculty of Medicine Board 21 June 2021

Enters into force: 1 July 2021

Responsible body: Faculty of Medicine

1. Subject definition

In this context, medical science is an umbrella term for research aimed at promoting human health and preventing ill health in various ways. The subject encompasses the study of everything from cells to society, including:

- medically relevant *in vitro* and *in vivo* models with molecular genetic, chemical, cell biological, physiological or pharmacological aspects
- epidemiological studies to understand the prevalence of and explanations for sicknesses and conditions in the population
- development of new diagnostic and treatment methods
- evaluation of preventive and health-promoting interventions and implementation as well as implementation of evidence-based knowledge in health care
- professional and organisational development relevant to medical science

After completing the programme, the doctoral student will have broad knowledge of medical science in general and a deeper grasp of their specialisation. The latter includes the ability to conduct research that significantly contributes to the subject area.

Research field

Each admission decision for a doctoral student is to specify a field within which the research will be conducted (a list of SCB's and UKÄ's research fields is available in Annex 1). The individual study plan is to clearly state how the doctoral student will attain a broad grasp and a systematic understanding of the relevant field.

2. Study programme objectives

The programme is at the doctoral level (third cycle). Provisions for doctoral education are found in the Higher Education Act Chapter 1, Section 9a.

The national learning objectives for the Degree of Doctor are listed in Annex 2 of the Higher Education Ordinance.

The national learning objectives for doctoral studies in medical science are defined by the Higher Education Ordinance, Chapter 6, Sections 4 and 5, where the concepts of *research field* and *limited area of this field* are interpreted



as medical science in the sense above, respectively as the doctoral student's specialist area within this subject. The outcomes defined in the Higher Education Ordinance are supplemented by local learning outcomes. Perspectives on sustainable development, interdisciplinarity, knowledge translation and equal opportunities are integrated into the structure and content of the programme.

See Annex 2 for national learning outcomes and local learning outcomes.

3. Entry requirements and prerequisites

For admission to doctoral studies, the applicant is to meet both the general entry requirements and the specific entry requirements as defined below and is deemed to have the ability required to benefit from the programme (Higher Education Ordinance, Chapter 7 Section 35).

General entry requirements

To meet the general entry requirements, applicants must have a master's degree, have completed course requirements of at least 240 credits, of which at least 60 credits were awarded at the master's level, or have completed a corresponding programme in Sweden or in another country or have equivalent qualifications. The Faculty may grant an exemption from the general entry requirements for an individual applicant if there special reasons exist (Higher Education Ordinance, Chapter 7 Section 39)

Specific entry requirements

For admission to doctoral studies, applicants must have:

1. the necessary knowledge from higher education or equivalent education and/or professional experience assessed in relation to the doctoral field Medical Science and the relevant research field according to Annex 1.
2. the necessary written and oral language skills in English. These skills are assessed by the applicant presenting their research plan in English before an assessment group appointed by the relevant head of department.

Applicants who have acquired for the most part equivalent knowledge in some other way are also considered to meet the specific entry requirements specified above.

4. Selection

A selection will be made among qualified applicants on the basis of the following criterion:

- Ability to benefit from doctoral studies

The applicant's ability to benefit from the studies is determined using the following criteria:

- Written and oral communication skills
- Critical thinking skills
- Analytical skills

*1.5 credits corresponds to 1 week of full-time studies



- Ability to perform within given timeframes

However, the fact alone that an applicant is considered able to transfer credits from prior courses and programmes or for professional or vocational experience may not give the applicant priority over other applicants (Higher Education Ordinance, Chapter 7 Section 41).

Selection of applicants for doctoral studies is made by the intended principal supervisor in consultation with the department's doctoral studies group. The applicant's potential for conducting doctoral studies in the relevant research field is assessed in an interview. A required admissions seminar in English is then held.

Admission decisions for doctoral studies aimed at a doctoral degree are made in accordance with the faculty's delegation of authority.

5. Structure and content

The aim of doctoral studies at the Faculty of Medicine at Umeå University is to increase knowledge in the field of medical science and thereby contribute to the development of society. After the doctoral degree, further work as a researcher is expected at a research institute or in industry, as a combined researcher and teacher within higher education, as a research-competent leader in the medical care system or industry, as a consultant etc. These different types of professional activities place different demands on an individual. As such, doctoral studies at the Faculty of Medicine must provide a broad base and prepare students for future research and work beyond the individual specialisation.

General

The doctoral education leading to a doctorate comprises four years of net study time equivalent to 240 credits. The studies consist of a faculty-wide part and an individual part. The faculty-wide part consists of a doctoral programme in medical science comprising 25 credits. Participation in the doctoral programme is compulsory for all doctoral students admitted to doctoral studies at the Faculty of Medicine from 1 July 2021. The individual part comprises 215 credits and includes a dissertation project, the writing of a doctoral dissertation of at least 180 credits and other educational components. A doctoral degree requires for-credit components of at least 30 credits, which means at least 5 credits of electives in addition to the compulsory doctoral programme.

An individual study plan is drawn up for each doctoral student. This plan includes the doctoral student's and the University's commitments and specifies funding, supervision, educational components within and beyond the doctoral programme, dissertation work and other aspects.

A student admitted to the doctoral programme leading to a doctorate may, if the student wishes, complete a licentiate as a step towards the doctorate. The requirements for the licentiate degree are described in the general study plan for the licentiate degree.

Doctoral programme

The faculty-wide doctoral programme of 25 credits can be studied either over 8 semesters (4 years) or over 12 semesters (6 years), with programmes starting each autumn and spring semester.

The content of the doctoral programme is based on the national and local learning outcomes. The aim of the programme is to support individual progression towards the degree's national learning objectives, provide opportunities for exchange across disciplines and departments, and promote equal opportunities in doctoral studies.



Structure of the doctoral programme

Programme activities occur at *cohort*, *base group* and *individual levels*.

- *Cohort level* corresponds to doctoral students admitted to the programme in the same semester and who progress together during the programme. This level consists of compulsory courses as defined in the programme's schedule. Cohort level provides a base of general knowledge and skills and common perspectives for all doctoral students.
- *Base group level* is smaller groups of doctoral students within the same cohort and, like the cohort level, they progress together throughout the programme.
The base group level provides a concrete platform for interdisciplinary exchange. Base group meetings are held each semester according to a flexible schedule and in seminar form with predetermined content for each meeting.
- *Individual level* corresponds to a doctoral student's individual studies at the department and a compulsory exchange period with another research environment (known as pre-doc).
Beyond the pre-doc exchange, studies at individual level are not part of the doctoral programme, but they are the basis for activities at the cohort and base group levels.

Content of the doctoral programme

The following compulsory components are included in the doctoral programme:

Cohort level: joint courses	Credits
Common basis for science and research	4
Research ethics	2
Academia writing	5
Oral presentations	1.5
Knowledge translation	1.5
Application writing	2.5
Total	16.5 credits

Base group level: base group meetings	Credits
Project presentations	1.5
Manuscript seminars	2
Preparations for the midway seminar	1.5
Application seminars	1
Preparations for the introductory chapter and	1
Total	7 credits

Individual level: pre-doc exchange	Credits
Pre-doc exchange	1.5–6.5*
Total	1.5–6.5 credits*

*Pre-doc comprising 1.5–6.5 credits can be counted towards the compulsory course requirement of 30 credits



Other compulsory components:

For-credit components comprising at least 5 credits in addition to the doctoral programme are required to achieve at least a total of 30 credits. The following components are required:

- Presentation at a minimum of one national/international conference (1.5 credits); applies to all doctoral students
- Course in laboratory animal science, *if* research with laboratory animals is included in the doctoral dissertation project
- Course in Good Clinical Practice (GCP), *if* clinical human research is included in the doctoral dissertation project
- Course in statistics, *if* statistical analysis is included in the doctoral dissertation project
- Course in qualitative methodology, *if* qualitative analysis is included in the doctoral dissertation project

To achieve the individual learning outcomes, additional subject-specific components may be required, such as elective doctoral courses, active participation in departmental seminars and journal clubs (max. 3.5 credits), additional presentations at national/international conferences, research visits at another university and participation in higher education teaching training. Decisions on subject-specific components are made in consultation with the doctoral student, supervisor and examiner and are documented in the individual study plan.

Approval of possible credits for compulsory courses must be attained prior to admission to doctoral studies and requests are submitted directly to the faculty's director of studies. Certificates from previous studies and their course syllabuses must be included.

6. Follow-up

The Faculty of Medicine has overall responsibility for doctoral studies, while the department where the doctoral student is admitted has responsibility for the individual student's education.

The doctoral student's education and progression are monitored regularly through an annual follow-up of the individual study plan. An annual follow-up must be carried out regardless of the scope of the doctoral studies.

An important part of this follow-up is the mid-way review. The mid-way review is compulsory, assuming that the doctoral student has not chosen to complete a licentiate degree. The departments are responsible for conducting the mid-way review. A copy of the certificate confirming the passed mid-way review is to be sent to the faculty office. The director of studies reviews the material.

7. Doctoral thesis

The doctoral thesis can be designed either as a compilation or monograph thesis. A doctoral thesis at the Faculty of Medicine should be written as a compilation thesis.

A compilation thesis is based on scientific papers and includes an introductory chapter with introduction, method description, summarising discussion, concluding discussion/reflections including a research ethics assessment, and a description of the thesis's benefit to the research community and to society at large. The doctoral student must independently write the introductory chapter. A compilation thesis normally consists of 3–5 scientific works. The included works must be of a scope and quality that ensure that the adopted national learning objectives are met. The number of included works required depends partly on the extent of these works and partly on the extent to which the doctoral student contributed to each included work.

The doctoral student's contribution must be clearly distinguishable and, for all the included works, constitute a significant part of the work. At least 2 included works must be accepted for publication in international journals with a peer-review system.



8. Summative assessment

The doctoral degree is awarded once the doctoral student has completed the doctoral programme comprising 240 credits as defined in this syllabus and thereby achieved a passing grade on the summative assessments of the programme, and has authored and publicly defended a doctoral thesis approved by the examining committee.

9. Provisional regulations

Doctoral students admitted before 1 July 2021 complete their studies according to the general study plan (FS 4.1.4-1421-15) which is valid through 30 June 2021. Doctoral students admitted before 1 July 2021 may, however, after consultation with their supervisor and examiner, request to continue their education according to the current study plan. If this is agreed upon, the individual study plan is to be updated. The faculty's director of studies makes decisions about this type of transition to the new study plan.

10. Other instructions

Current regulations regarding doctoral studies are specified in:

- The Higher Education Ordinance (HEO): Chapter 5 Employment of doctoral students, Chapter 6 Courses and study programmes and Chapter 7 Admission to courses and study programmes, Annex 2 System of Qualifications.
- Admission regulations for doctoral education at Umeå University.
- Local system of qualifications at Umeå University.
- Rules for doctoral education at Umeå University.
- Doctoral student handbook at the Faculty of Medicine at Umeå University.



Annex 1 Doctoral subject specialisations in medical science

SUBJECT SPECIALISATION

Family Medicine
Family Medicine and Epidemiology
Anatomy
Anaesthesiology
Angiology
Occupational Therapy
Child and Adolescent Psychiatry
Diagnostic Radiology
Bioinformatics
Biomaterial
Biomedical Laboratory Sciences
Dermatology and Venereal Diseases
Endodontics
Epidemiology and Public Health
Pharmacology
Public Health
Physiology
Physiological Chemistry
Physiotherapy
Gastroenterology and Hepatology
Geriatrics
Global Health
Gynaecological Oncology
Hand Surgery
Haematology
Histology with Cell Biology
Sports Medicine
Immunology
Infection Epidemiology
Infectious Diseases
Cardiology
Cariology
Surgery
Clinical Bacteriology
Clinical Pharmacology
Clinical Physiology
Clinical Immunology
Clinical Chemistry
Clinical Microbiology
Clinical Neurophysiology
Clinical Oral Physiology
Cognitive Neuroscience
Oral Surgery
Speech Therapy
Pulmonary Medicine
Medicine
Medical Biophysics
Medical Genetics
Medical Chemistry
Medical Psychology
Medical Engineering
Molecular Biology
Molecular Medicine
Neurosurgery
Neurology
Obstetrics and Gynecology
Ophthalmology
Nursing
Oncology
Oral Cell Biology

DEPARTMENT

Public Health and Clinical Medicine
Public Health and Clinical Medicine
Integrative Medical Biology
Surgical and Perioperative Sciences
Public Health and Clinical Medicine
Community Medicine and Rehabilitation
Clinical Sciences
Radiation Sciences
Clinical Microbiology
Odontology
Clinical Microbiology Cell Biology Integrative Medical Biology
Public Health and Clinical Medicine
Odontology
Epidemiology and Global Health
Integrative Medical Biology
Epidemiology and Global Health
Integrative Medical Biology
Medical Biosciences
Community Medicine and Rehabilitation
Public Health and Clinical Medicine
Community Medicine and Rehabilitation
Epidemiology and Global Health
Radiation Sciences
Surgical and Perioperative Sciences
Radiation Sciences
Integrative Medical Biology
Community Medicine and Rehabilitation
Clinical Microbiology
Clinical Microbiology
Clinical Microbiology
Public Health and Clinical Medicine
Odontology
Surgical and Perioperative Sciences
Clinical Microbiology
Integrative Medical Biology
Surgical and Perioperative Sciences
Clinical Microbiology
Medical Biosciences
Clinical Microbiology
Integrative Medical Biology
Odontology
Integrative Medical Biology
Odontology
Clinical Science
Public Health and Clinical Medicine
Public Health and Clinical Medicine
Medical Chemistry and Biophysics
Medical Biosciences
Medical Chemistry and Biophysics
Clinical Science
Radiation Sciences
Molecular Biology/UCMM
UCMM
Clinical Science
Clinical Science
Clinical Science
Clinical Science
Nursing
Radiation Sciences
Odontology



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Oral Diagnostic Radiology	Odontology
Oral Health	Odontology
Oral Medicine	Odontology
Oral Microbiology	Odontology
Orthodontics	Odontology
Orthopaedics	Surgical and Perioperative Sciences
Periodontology	Odontology
Pathology	Medical Biosciences
Paediatrics	Clinical science
Paediatric Odontology	Odontology
Plastic Surgery	Surgical and Perioperative Sciences
Professional Development	Clinical Science
Prosthodontics	Odontology
Psychiatry	Clinical Science
Radiophysics	Radiation Sciences
Radiography	Nursing
Rehabilitation Medicine	Community Medicine and Rehabilitation
Rheumatology	Public Health and Clinical Medicine
Forensic Medicine	Community Medicine and Rehabilitation
Sexual and Reproductive Health	Nursing
Social Medicine	Public Health and Clinical Medicine
Urology	Surgical and Perioperative Sciences
Virology	Clinical Microbiology
Occupational and Environmental Medicine	Public Health and Clinical Medicine
Otorhinolaryngology (ENT)	Clinical Science



Annex 2. Degree objectives

Qualitative targets

Higher Education Ordinance, Chapter 6, Sections 4 and 5)

Knowledge and understanding

For a Degree of Doctor, the doctoral student is to

- demonstrate a broad grasp of and systematic understanding of the research field as well as advanced and up-to-date specialised knowledge in their research field, and
- exhibit familiarity with scientific methodology in general and with the specific research area's methods in particular.

Competence and skills

For a Degree of Doctor, the doctoral student is to

- demonstrate an ability for scientific analysis and synthesis, independent critical analysis and assessment of new and complex phenomena, questions and situations;
- demonstrate an ability to critically, independently, creatively and with scientific accuracy identify and formulate questions and to plan and with adequate methods conduct research and other qualified tasks within defined timeframes and to review and assess such work;
- through a thesis, to demonstrate the ability through personal research to substantially contribute to the development of knowledge;
- demonstrate the ability, in both national and international contexts, to authoritatively present and discuss, orally and in writing, research and research findings in dialog with the scientific community and society at large;
- demonstrate the ability to identify the need for further knowledge; and
- demonstrate the basis for contributing to the development of society and supporting the learning of others within both research and education and in other qualified professional contexts.

Judgement and approach

For a Degree of Doctor, the doctoral student is to

- demonstrate intellectual independence and scientific integrity as well as the ability to assess research ethics; and
- demonstrate in-depth insight into the possibilities and limitations of science, its role in society and the responsibility of individuals for how it is used.



Local learning outcomes for the degree

Knowledge and understanding

For the Degree of Doctor, the doctoral student is to

- show a broad grasp of scientific theory and sustainable development in general and in medical science in particular.

Competence and skills

For the Degree of Doctor, the doctoral student is to

- show a good ability to relate their own research to other ongoing medical research and, ultimately, to clinical applications and other societal benefits.

Judgement and approach

For the Degree of Doctor, the doctoral student is to

- show a good ability to relate to the complexity of medical research, its ethical aspects and its impact on the individual and society.