

SYLLABUS FOR THE GRADUATE SCHOOL

APPLIED ACOUSTICS

Established by the First Vice President on 2005-11-08, registration number C 2005/1199.

Latest revised on [date of decision 2021-07-06], registration number ACE 2021-0171.

This syllabus applies to doctoral students admitted as of 2021-08-20.

Transitional regulations:

A doctoral student admitted to an older syllabus may earn a degree in accordance with this, provided that the current Appointment regulation for doctoral programmes and current Local Qualifications Framework – third cycle qualifications are followed.

Doctoral students admitted to an older syllabus of graduate school Applied Acoustics can, however, change to the current syllabus by an application to the Deputy/Vice Head of Department. The change must be documented in the individual study plan.

The graduate school is regulated by the *Appointment regulation for doctoral programmes* and the *Local Qualifications Framework for Chalmers University of Technology - third cycle qualifications* and is described in the syllabus for the graduate school. In the event of any conflict between the documents, the *Appointment regulation for doctoral programmes* and the *Local Qualifications Framework for Chalmers University of Technology - third cycle qualifications* are governing. For the most recent version of all regulatory documents referenced in this syllabus, see Chalmers's internal website.

1. Subject description

Description of subject

Sound and vibration are a fundamental part of our daily life. Visual and auditory stimuli deliver our main stream of information from the outer world. The recognition of acoustics as a subject therefore dates far back in history. As a discipline, acoustics has experienced its main development over the past 150 years.

Today, it is highly interdisciplinary and comprises numerous subdisciplines (e.g. underwater acoustics, electroacoustics, structural acoustics or psychoacoustics). These subdisciplines are grouped around the fundamentals of acoustics containing the basic physics of wave generation and wave propagation in different media. The subdisciplines also represent the link to other disciplines inside Earth science, Life science, Arts and Engineering as shown in Lindsay's "acoustic wheel" published 1964 in the Journal of the Acoustical Society of America.

The main driving force for the development of the subject of acoustics with its subdisciplines stems from the needs to create and preserve healthy and sustainable environments as well as to support the development of products and services with appropriate sound and vibration properties. The graduate school in Applied Acoustics offers an education in a variety of these subdisciplines with a strong focus on fostering the interdisciplinary character of the field.

2. Objectives of the doctoral program

Objectives

The national objectives for third cycle degrees (licentiate and doctoral degree) and local requirements are stated in the *Local Qualifications Framework for Chalmers University of Technology – third cycle qualifications*.

Objectives specific for the graduate school

Typically, students at the graduate school have very diverse backgrounds fitting well to one or a few subdisciplines inside acoustics. The specific objective of the graduate school is therefore to ensure that students after passing the education have broadened their fundamental knowledge in acoustics, preparing to enter further subdisciplines inside acoustics in their professional career.

3. Entry requirements

General entry requirements

To be qualified for admission in Applied Acoustics the student must have earned a degree at the second-cycle level. The orientation of the student's degree shall also have a sufficiently close connection to the subject of the doctoral programme. Equivalent requirements apply to individuals who have taken their first degree in a country other than Sweden. The examiner, in consultation with the principal supervisor, shall assess whether the applicant has the requisite capacity to successfully complete the doctoral programme. Other requirements for general entry are regulated in *Appointment regulation for doctoral programmes*.

Admission

Regulations regarding admission are stated in *Appointment regulation for doctoral programmes*.

4. Curriculum

The study programme towards a doctoral degree encompasses 240 higher education credits. The study programme towards a licentiate degree encompasses at least 120 higher education credits. One year of full-time studies equals 60 credits.

For the licentiate degree programme the credits are distributed between courses and thesis work as follows: courses at least 30 credits and thesis at least 60 credits.

For the doctoral degree programme the credits are distributed between course work and thesis work as follows: courses at least 60 credits and thesis at least 180 credits.

Courses

Courses within the graduate school include general courses that cover all doctoral programmes at Chalmers as well as courses specific for the graduate school.

General courses in Chalmers's doctoral programmes

The general course requirements for doctoral programmes at Chalmers are regulated in *Local Qualifications Framework for Chalmers University of Technology – third cycle qualifications*.

Courses specific for the Graduate school Applied Acoustics

On an individual base courses should be selected which broaden the profile of the students inside the field of acoustics. Typical examples of such courses are

- Theoretical Acoustics
- Numerical Acoustics
- Experimental Acoustics
- Psychoacoustics
- Signal Processing

It is the task of the supervisor and examiner to guide the students among the courses offered by the MSc programme Sound and Vibration, courses offered inside the graduate school, in a Nordic cooperation or inside the activities of the European Acoustic Association, in order to broaden their individual profile.

Licentiate thesis

A licentiate thesis shall be written in English. In exceptional cases it can be written in Swedish ; in such cases it shall contain a summary in English.

The purpose of the licentiate thesis is to account for the relevant scientific results that have been attained during the thesis work and describe these in a way that is accessible outside of the scientific inner circle of researchers. A licentiate thesis can either be written as a compilation thesis or as a monograph. If the licentiate thesis is a compilation thesis it should begin with an introduction, a summarizing text, followed by the included scientific articles. The purpose of the summarizing text is to put the studies in context, and to present relevant results that for various reasons are not described within the articles.

Other regulations concerning the licentiate thesis are stated in *Appointment regulation for doctoral programmes*.

Doctoral thesis

A doctoral thesis shall be written in English. In exceptional cases it can be written in Swedish ; in such cases it shall contain a summary in English.

The purpose of the doctoral thesis is to account for the relevant scientific results that have been attained during the thesis work and describe these in a way that is accessible outside of the scientific inner circle of researchers. A doctoral thesis can either be written as a compilation thesis or as a monograph. If the doctoral thesis is a compilation thesis it should begin with an introduction, a summarizing text, followed by the included scientific articles. The purpose of the summarizing text is to put the studies in context, and to present relevant results that for various reasons are not described within the articles.

Other regulations concerning the doctoral thesis are stated in *Appointment regulation for doctoral programmes*.

Supervision

The *Appointment regulation for doctoral programmes* states that for each doctoral student at least two supervisors shall be appointed. One of them shall be appointed principal supervisor. The doctoral student has the right to supervision during the studies unless the Head of Department decides otherwise.

Other regulations concerning supervision are stated in *Appointment regulation for doctoral programmes*.

5. Examination

After completion of a doctoral programme a doctoral degree is awarded. A licentiate degree can be an intermediate stage in a doctoral degree. If a licentiate degree is not a part of the individual study plan, a midway seminar shall be held to denote that licentiate level has been reached.

Examination, licentiate degree

For a licentiate degree to be awarded, the doctoral student must have received a grade of pass for the licentiate thesis and its presentation and must also have received a grade of pass for the other elements that are included in the programme.

Examination, doctoral degree

For a doctoral degree to be awarded, the doctoral student must have had a doctoral thesis and its defence approved and must also have passed the other elements that are included in the programme.

Other regulations regarding examination are stated in:

- *Appointment regulation for doctoral programmes*
- *Local Qualifications Framework for Chalmers University of Technology – third cycle qualifications*

6. Title of degree

The title of qualification is *Teknologie doktorsexamen i Teknisk akustik*. The English translation of the title of the qualification is *Degree of Doctor of Philosophy in Applied Acoustics*.

For a licentiate degree the title of the qualification is *Teknologie licentiatexamen i Teknisk akustik*. The English translation of the title of qualification is *Degree of Licentiate of Engineering in Applied Acoustics*.

The degree is given a title corresponding to the name of the faculty within which the undergraduate degree was earned. The title is determined by the Head of Department in connection with admission.

Any decision regarding exemption from use of the defined title is made by the Head of Department. In some individual cases, it is possible to use a title that does not correspond to the name of the faculty within which the undergraduate degree was earned.