ADVANCED ENGINEERING MATHEMATICS

**1. Goal of the program**

The purpose of the graduate program is to give the student basic knowledge in mathematics and mathematical statistics, deeper insight into industrial applications and skills in research methodology.

The aim of the licentiate degree is to enable the student to independently participate in research and development work.

**2. Eligibility and prerequisites**

The normal requirement for being accepted to the graduate school is a Master’s degree in engineering mathematics, engineering physics or mathematics. For admission to the AEM program one is expected to have taken basic courses in Fourier analysis and functional analysis. One is moreover expected to have expertise at Master’s level in optimisation, statistical inference and partial differential equations. Together these requirements should comprise at least 30 credits, which will later be possible to include in the licentiate degree.

Persons who have acquired comparable abilities in a different way are also eligible.

**3. Structure of the program**

The licentiate education comprises 120 credits; one year’s full time studies should give 60 credits. Observe, however, that 30 of these 120 credits are already included in the requirements for admission, see above.

The graduate education consists of

* A basic study course
* An individual study course
* Participation in seminars and guest lectures
* Scientific work with industrial applications, leading to a licentiate thesis.

Teaching in the graduate program consists of lectures, seminars and possibly advising undergraduate work. The student should contribute to the scientific activities of the department by attending seminars and guest lectures, even if these are not directly related to the study course. The students are also expected to, as a part of their education, actively participate in seminars, for instance by giving survey lectures.

**4. Courses**

**4.1. Basic study course.** The basic study course is aimed at giving the student a solid foundation in mathematics and preparation for the licentiate project. It comprises 54 credits and consists, apart from the 30 credits which can be counted from the admission requirements, of the following seven courses. The first five courses are part of the Chalmers-wide program in Generic and Transferrable Skills (GTS). For more information on this program, see http://www.chalmersprofessional.se/en/genericskills#.U5Rd8PH7vE4

* GFOK015: Introductory Day for PhD Students (0hp)
* GFOK020: Teaching, Learning and Evaluation (3hp)
* GFOK025: Research Ethics and Sustainable Development (3hp)
* GFOK010: Career Planning - Your Personal Leadership (1.5hp)
* One further elective GTS course (1.5hp)
* TMV100: Integration Theory (7.5hp)
* TMS031: Experimental Design (7.5hp)

**4.2. Individual study course**. The student, supervisor and examiner determine in consultation an individual study course, which comprises 6 credits.

**5. Licentiate thesis**

For the licentiate degree, the student should write a thesis corresponding to 60 credits. The topic for the thesis is chosen by the industrial partner and the work is supervised by and conducted with them, in consultation with the academic supervisor (see 8. Supervision). The student is employed by the industrial partner for the duration of the project. The thesis is presented at a seminar, and graded on a pass/fail basis.

**6. Licentiate degree**

For the licentiate degree, the student must complete

* the basic study course of 54 credits.
* the individual study course of 6 credits.
* the thesis of 60 credits, in accordance with 5. above;

in total 120 credits.

**7. Name of Degree**

The degree awarded at the conclusion of the program is Licentiate of Engineering in Mathematics with Specialization in Advanced Engineering Mathematics.

**8. Supervision**

A student accepted into the AEM program has the right to a supervisor. For full-time students, supervision is guaranteed for three academic terms. Upon admission to the program, the student is assigned both an academic and an industrial supervisor, with the latter based at the industrial partner.

The prefect also assigns an examiner at the Department of Mathematical Sciences, who approves the study course and confirms higher education credits and grades on courses. The academic supervisor and examiner must be two different people. The examiner, supervisor and student work together to plan the student’s progress through the program.

**9. Examination**

Examination is organized for each course. It may be written or oral. Exams are judged on a pass/fail basis by a course examiner. The grade for the licentiate thesis is decided by the examiner.

**10. Further instructions**

The student should regularly give an account of his or her progress and plans.