

Programme description

PhD programme in Information and Communication Technology (ICT)

The following document is a translation of a document originally written in Norwegian. If dispute arises as to the interpretation of the programme description, the Norwegian version takes precedence.

PhD programme - 180 credits - 3 years - Grimstad

Educational requirements

To be admitted to the PhD programme the applicant must meet one of the following requirements to competence in information and communication technology:

- Hold a master's degree in a relevant subject area from a Norwegian university or qualifications approved as equivalent.
- Have different educational qualifications and credentials at master's degree level which upon individual evaluation are approved as a basis for admission.
- Have an educational qualification from an institution abroad (full degree) which is equivalent to minimum 4 years in the Norwegian university system and which formally qualifies for admission to doctorate studies in the country where the degree was awarded. The Faculty determines the number of credits that the qualification corresponds to at the Faculty of Engineering and Science. Applicants with an education of less than 5 years must expect that additional requirements will be imposed upon them, and that they will only receive a conditional offer of admission.

As a general rule, the following should apply:

- The average grade for courses included in the bachelor's degree (or equivalent) should be C or higher.
- The average grade for courses included in the master's degree (or equivalent) should be B or higher.
- The master's thesis (or equivalent) should have the grade B or higher.

In those instances where the applicant's average grades are lower than normally required, the research group must document the probability of the applicant completing the PhD programme. In such an event, the Department may recommend extra requirements to be included in the basis for admission.

Competence in English is a requirement for all applicants to the PhD programme. International students that are not exempt from the English language requirements pursuant to the guidelines of the Norwegian Agency for Quality Assurance in Education (NOKUT) must document this through one of the following tests with the stated results or better:

- TOEFL – Test of English as a Foreign Language with the minimum score of 550 on the Paper-based Test (PBT), or 80 on the Internet based Test (iBT).
- IELTS – International English Language Testing System, with the result of 6.0.

Recommended previous knowledge

The course programme presupposes knowledge at the master's level within one of the main areas for the PhD programme in ICT. Applicants who lack such prior knowledge can compensate for this by completing other courses at the Faculty for Engineering and Science and may be imposed to participate in such training. Applicants with little or no training in research work from their earlier education or work experience have to anticipate extra large work load to carry out the programme within 3 years.

General description of the programme

The doctoral programme is a research education. The main objective of the PhD programme is that the student attain a high level of scientific expertise in one of the main areas in ICT. The PhD students will receive formal training and supervision, providing him/her with a broad scientific knowledge and a further depth and give them the ability to do his/her own independent research. The student attain scientific expertise through accomplishing an independent research work leading to a scientific dissertation. The research work and dissertation should be of international standard.

The PhD degree is awarded on the basis of:

1. Approved completion of the coursework component
2. Scientific dissertation
3. Doctoral degree trials

The doctoral degree trials consist of a trial lecture on a prescribed topic and a public defence of the dissertation (disputation).

The coursework component (theoretical curriculum) should usually correspond to 30 credits, and never less than 30 credits. The coursework component is individual for every PhD student. However, the content of the coursework component must be such that it, along with the dissertation, provides professional breadth and depth in the academic field.

The trial lecture on the prescribed topic comes in addition to the coursework component. The same is active participation in the Faculty's Forum with 2-3 presentations.

The programme's structure

A PhD student in ICT at the Faculty of Engineering and Science has to choose from and carry out the research work in one of the main areas where the research group offers teaching and supervision. These main areas are described on the Faculty's PhD web pages (<http://www.uia.no/tekreal/phd/ict>).

The teaching assortment consists of a basic course, in-depth and advanced specialisation courses within each main area. Basic courses and in-depth courses all give 5 credits. Course descriptions are on the web pages for the PhD programme in ICT (<http://www.uia.no/tekreal/phd/ict>).

The coursework component should usually consist of at least 20 credits based on technological courses or science subjects and at least 5 credits on the theory and ethics of science.

The courses included in the coursework component should be advanced courses taken at the University of Agder or other universities. At the Faculty of Engineering and Science the courses will usually be PhD courses.

All courses to be included in the coursework component, and taken after admission to the PhD programme must conclude with a graded examination (Pass/Fail). The grade B or higher must be achieved in order to pass a course.

The coursework component should be put together in such a way that the following requirements to contents, academic breadth and depth are fulfilled:

- (1) Specialisation courses (in-depth courses and advanced specialisation courses) within the main area of the research topic shall consist of at least 15 credits.
- (2) Basic courses from other areas than the main area of the research topic and other breadth courses at PhD level shall consist of at least 15 credits.

- (3) One course on the theory and ethics of science of at least 5 credits shall be included in the breadth courses (cf. point 2)
- (4) Researcher course or special syllabus at PhD level may be included as specialisation courses (cf. point 1) limited to 10 credits.

Researcher course or special syllabus mentioned in point 4 represents national or international researcher courses, or is covered through a special syllabus in the form of literature studies or methodology studies which are relevant to the research programme.

The researcher course should be evaluated by the Department with regard to the extent and academic level of the course. The following norm should apply: 25-30 hours student input are credited with 1 credit (pursuant to the European Credit Transfer System – ECTS). In order to have a researcher course approved, the student must hold seminar following completion of the course. The seminar should be evaluated by an examiner appointed by the Faculty. Exceptions can be made for researcher courses which are regulated at other universities and which have a final examination.

Courses taken in the form of special syllabus are to be described in an appropriate form where the content, level and extent correspond to other course descriptions given on the Faculty's web pages. The type of examination must be stated. The description of the syllabus must be approved by the Department prior to the examination.

The Faculty credits researcher courses and special syllabus with credits only in whole units.

The coursework component must be completed successfully and passed in its entirety before the student can apply to the Faculty to have the dissertation assessed.

Learning outcomes

After accomplishing the PhD degree, the students should have scientific competence at highest level in ICT. The students shall have acquired wide academic knowledge in ICT, academic depth within a main area in ICT, ability to perform own research in the area, and an independent and thoughtful relation to research in own subject area. Graduate candidate shall be qualified for research activities and other types of work in which a high degree of academic expertise and scientific competence are required.

Teaching methods

The PhD programme is designed to encompass a three-year period of full-time study. Plans for completion of the PhD programme over a period longer than six (6) years will not be approved.

The PhD programme is a research education consisting of a coursework component of at least 30 ECTS credits and a research task, the doctoral dissertation, which amounts to 150 ECTS credits (2,5 years of work). The dissertation is prepared under the supervision of two highly qualified scientists.

The teaching methods in the coursework component appear from the course descriptions. In the event of several courses offered in the same semester, the teaching arrangement will be coordinated.

The courses will usually be taught in English.

Evaluation methods

All courses or other activities to be included in the coursework component must have a final evaluation. Most courses are concluded with an oral examination, possibly in combination with a project report or an essay. The evaluation method in the courses appears in the course descriptions.

The evaluation expression is pass/fail, where pass corresponds to the grade B or higher.

The doctoral programme concludes with a trial lecture on a prescribed topic and a public defence (disputation) where the candidate gives an account of the results of the scientific investigations in the dissertation, etc. The disputation is further described in the *Supplementary regulations for the PhD Degrees in Information and Communication Technology and Mechatronics at the University of Agder*.

Student exchange

All PhD students with previous education from Norway should include a stay at a foreign university with a recognized research environment within the research field of the individual student. The stay may be of 3-6 months duration, preferably at an institution recommended by the supervisors.

Research will be the main goal of the stay abroad, but additionally, PhD students may complete some of their courses at the foreign institution. Passed examinations in courses completed abroad can substitute corresponding mandatory and specialisation courses in the course programme and thus form part of the coursework component. In addition, credits may be awarded for research training courses etc. completed abroad, as described above.

Professional goal and access to further studies

The PhD programme is the highest education in the country, and qualifies for university and college appointments at the associate professor level. Alternative career paths are found in research institutes, as well as research departments in industry and business, and other types of work in which a high degree of academic expertise is required.

Qualification awarded

Philosophiae doctor (PhD) in information and communication technology (ICT).

Responsible Faculty

Faculty of Engineering and Science

Contact person

For additional information, please contact the Head of the Department, Professor Andreas Prinz (phd-ict@uia.no).