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| General Facts & Figures |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Legal framework for doctoral education | Regulated by law and agreement with the Ministry of Education and Culture | Regulated by law and agreement with the Swedish government | Regulated by law – same for all Danish universities | Regulated by law – same for all Swedish universities. For doctoral degree, with a certain specialization, further specific requirements set by KTH in study plan for a third-cycle subject. | Regulations for the philosophiae doctor degree (PhD) at NTNU |
| Current number of doctoral candidates  | 3200 of which 1300 full-time | 1140 | 1406  | Ca 2000 | 2363 |
| Female candidates  | 33 % | 31 % | 36 %  | 30% | 42 % |
| International candidates  | 18 % | 27 % (have their qualifying education from other countries) | 65 %  |  47% (2015) | 40 % |
| Duration  | normative duration 4 years | Up to 5 years | 3 year contract  | 4 years | 3 year contract |
| Funding base money  | GovernmentIndustryResearch councilsInternational funding | Government: 34 %Industry: 15 %Research councils: 32 %EU funding: 8 %Other: 11 % | Government: 40 %Industry: 15 %Research councils: 34 %Other: 10% | GovernmentIndustryResearch councilsInternational funding | Government: 47 %Industry: 32 %Research councils: 21 % |
| Status/Employment  | employed by Aaltoemployed by research institute employed by company scholarships | Employment (at Chalmers, at companies, or at affiliated universities) | 86 % employed by DTU12 % employed by company 2 % scholarships from abroad  | PhD student employmentExternally employedScholarships from abroadOther fundingOther KTH-employment | NA |
| Contracts with companies | Contracts are made when a company is financing the research work | Chalmers has a standard contract when a company is financing a PhD student. | DTU has standard contracts, if a company is (co)financing a project | Yes, but no standard contract. | NTNU has a standard contract if a company is (co)financing a PhD project.  |
| IPR | The results generated in open research are owned by the author/inventor, as opposed to the results of collaborative projects, which belong to the employer (university). | NA | DTU owns the IPR as long at the PhD student is employed by DTU. If a patent is sold the profit is divided between the department, DTU and the inventor. | The “professors’ exception” (privilege) gives IP ownership to the scientist himself. KTH-staff who has developed IP and intends to commercialize this, should inform KTH. | NTNU owns the IPR as long as the PhD candidate is employed at NTNU. If a patent is sold, the profit is divided between the inventor, the Department and NTNU. |
| Salary – monthly during study | Varies, normally from € 3000 upwards | Initial salary is SEK 27 835 (approx. € 3000.) Gradual increase based on completion of part of education (SEK 31 500 after 50 % and SEK 32 660 after 80 % completion of doctoral studies). | Between DKK 29,100 – 35,200 inclusive pension.(EURO 3,900 – 4,725)  | For candidates employed as doctoral students there is a wage structure with gradual increase based on completion of part of education. Current initial salary is SEK 28 100 (ca €2900) with 32 800 after 80 % completion of doctoral studies. For scholaships a minimum of SEK 15 000 per month is required. | NOK 35 780 – 40 200= € 3800-4270  |
| Structure | 6 doctoral programmes, one in each Aalto School | 31 PhD schools |

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| 20 PhD schools affiliated to 5 PhD programmes  |

 | 30 PhD programs together including 41 subject areas. | About 50 PhD programs. 7 research schools |
| Number of PhD courses available | NA | NA | Approx. 140  | Review in progress of course offerings. | NA |

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| Admission & introduction |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Requirements | Master’s degree, as a rule. International degree at least 4 years including a thesis similar to the master’s thesis. European degrees in accordance with the Bologna Process  | Academic degree on advanced (master’s) level, or completed courses of at least 240 ECTS, of which at least 60 ECTS should be on advanced (master’s) level.  | An MSc with honours (2 years) + a high grade for the master's thesis. | A second cycle qualification comprising at least 240 ECTS (or completed courses of at least 240 ECTS) out of which at least 60 ECTS on second cycle. | 5 years higher education, incl. master’s degree (2 years) with weighted average grade B or higher |
| Introduction incl. services | Local introduction and guidance for new PhD students in Aalto Schools. | * Joint introduction for all new PhD-student
* Local introduction at the departments
* Mandatory course in Career Planning
* Career Service Center
 | * Assistance applying for work & residence permit
* Welcome meeting
* Introductory day
* Local intro courses at some the PhD schools
 | * Graduate students with employment are aided in finding accommodation.
 | * Assistance applying for residence and work permit
* Introduction of new employees
* Introduction course for new employees
* Introductory course at the PhD programs
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| Language requirements | Fluent English required, normally to be documented. | English language test (e.g. Test of English as a Foreign Language (TOEFL)) for admission | Fluency in spoken and written English. No formal test. | Necessary skills in English. No formal test. | English requirement is normally to be documented. |

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| Supervision |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Supervisor criteria  | Supervising professor, one or more thesis advisorsSupervising professor must be employed at Aalto. In specific cases a co-supervisor is appointed, can also be external professor. | One principal supervisor and one or more assistant supervisors.The principal supervisor should at least be on the level of associate professor and be affiliated to Chalmers. | One principal supervisor – must be professor, senior associate professor, associate professor, senior researcher or with corresponding academic qualifications. Must be full-time employee at DTU.  | A minimum of two supervisors, one of them appointed as main supervisor. Professors, guest professors or adjunct professors employed on at least 20 % of full-time at KTH may be appointed as main supervisors. Adjunct professors should also be docent at KTH. At least one of the supervisors must have completed a research supervision-course. | 2 academic supervisors. If the main supervisor is external, the other must be an academic staff member at NTNU. In addition, mentors who do not meet formal qualifications may provide supervisory assistance. |
| Supervision ratio | No limit | No limit. | No limit, a co-supervisor is recommended.  | No limit.  | No limit.  |
| Agreement on the form of supervision | Supervising professor, thesis advisor(s) and the doctoral candidate make a written supervision agreement where they agree on the responsibilities, rights and obligations of each party involved in the doctoral training process.  | Part of the study plan. | As part of the study plan an agreement on supervision should be made. Supervision every two weeks is recommended. | The parties are to agree on how often supervision should take place and in which form. Part of the study plan. | The parties have a mutual obligation to keep each other informed about progress of work in relation to the project description. |
| Evaluation of the course of study/ work progress | Studies are followed up regularly and the individual study plan is reviewed annually and revised as necessary. | The Director of Studies is responsible for ensuring that studies are followed up each year and that the individual study plan is reviewed annually and revised as necessary. | Every six months, the main supervisor must evaluate if the studies are progressing satisfactorily.  The report is signed by Head of PhD school, main supervisor and PhD student.  | At least yearly follow-up of the individual study plan. Conditions to be discussed must be clearly stated in the documentation. The director of third-cycle education may initiate revision of the plan at any time. | Candidate and main supervisor submit individual progress reports annually.A more in depth midway evaluation is undertaken for all candidates. |
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| Educational activities |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| The PhD programme | * Completion of required course work
* Doctoral thesis
* Public defence
 | * A scientific project
* A PhD thesis
* General introduction
* Graduate courses and courses in Generic & Transferable Skills
* Teaching (max. 20 %)
* Popular presentation (written and oral) of research work
* A public defence
 | * An independent scientific project
* A study programme of 30 ECTS
* Teaching and dissemination activities corresponding to approx. 3 months
* An external research stay
* A PhD thesis
* A public defence
 | * Completion of required course work and other requirements according to study plan for the third-cycle subject
* A PhD thesis, at least equal to 120 ECTS
* A public defence of the thesis.
 | * An academic thesis
* Completion of required course work
* A trial lecture on an assigned topic
* A public defence of the PhD thesis
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| Course work | The extent varies between the fields. Science and Technology 40 ECTS, others 60 ECTS  | The extent varies between the different graduate schools. Minimum of 60 ECTS credits.  | 30 ECTS credits | At least 60 ECTS, more if stated in study plan for a third-cycle subject. | 30 ECTS credits |
| PhD study plan | A personal study plan must be submitted in the beginning of studies. Standard form is used. | An individual study plan should be submitted to the Director of Studies no later than three months after admission. The principal supervisor is responsible for ensuring that this is done. The examiner shall approve the individual study plan. | A personal study plan must be submitted no later than two months after commencement.Standard form is used. | Compulsory. Standard form is used. The individual study plan is to be established in connection with admission.Electronic individual study plan is introduced October 1, 2016. | Preliminary project description included in application for admission. Complete project description within 6 months of admission.  |
| Teaching and dissemination requirement | Dissemination of research results is part of doctoral studies | Teaching in Chalmers' undergraduate programmes and other duties at maximum 20 % of the working hours.  | The PhD student must gain experience in presenting research results, e.g. by teaching activities, presentations at conferences, dissemination of research results. | The PhD student must demonstrate knowledge of scientific method, the capacity for scientific analysis and synthesis, orally and in writing with authority present and discuss research and research findings, contribute to social development and support learning of others. | The PhD candidate must gain experience in communicating knowledge through e.g. scientific articles and presentations at conferences. |
| External stay of research | Doctoral candidates are encouraged to participate in international collaboration and to spend time abroad. | Chalmers encourage doctoral students to participate in international collaboration and/or to spend time abroad.  | The PhD student should enter into active research environments outside DTU as part of the programme, either through stays at other institutions of research or private research companies etc. - primarily foreign ones. This also applies to industrial PhD students. | Internationalization is encouraged. | Internationalization is encouraged. |
| PhD thesis | The thesis may be a monograph or a compendium of scientific articles and a summary of these. | Either a summary of scientific essays (compilation thesis), or a monograph thesis. | It is recommended that the thesis is based on scientific articles already published (or submitted). Monographs are also accepted. | The thesis is normally a compilation of scientific papers with an introduction and a summary. It may also be a uniform, coherent scientific work (monograph thesis). | The thesis may be a monograph or a compendium of shorter scientific papers/articles with clarification how they are interrelated. |

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| Completion of the PhD studies |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Manuscript ready | Application of preliminary examination of doctoral dissertation can be submitted when all formal requirements are met, incl. statement from supervising professor. When permission to publish is granted, the candidate publishes the dissertation in print and in electronic format prior to the defence. | The PhD student shall report to the head of department (or deputy head of department) that he or she wishes to defend the thesis. This should be made no later than three months prior to the planned date of the defence. | The PhD thesis is handed in at the same time as a report on the entire PhD course of study.  | The doctoral thesis, in final printed version, including appendices and papers, must be available (published) at least three weeks prior to the public defense. | Application of assessment of PhD thesis can be submitted when all formal requirements are met, incl. statement from main supervisor. |
| Preliminary Examination/Quality Check | The manuscript is normally sent to two preliminary examiners. The Doctoral Programme Committee of the School evaluates the dissertation based on statements of the examiners. After the evaluation, the Committee decides on the permission to publish | An advance examination of the thesis is made in the manner decided by the head of department or deputy head of department. | The assessment committee gives a preliminary evaluation of the thesis no later than two months after submission.  | After checking the manuscript for plagiarism (done by main supervisor) a separate advance independent review is done at least five weeks before planned public defence.The review is completely separated from decisions made by the examination committee at the public defence. | The Faculty may reject an application for assessment of a PhD thesis if it is evident that it does not meet sufficiently high scientific quality standards. |
| Negative preliminary evaluation by the assessment committee | If the manuscript demands extensive corrections, the permission to publish is not granted. If the corrections needed are minor, the candidate is given the chance to revise the manuscript | The result of the advance examination of the thesis is handled in the manner decided by the head of department or deputy head of department. | If the thesis is not considered qualified it may be submitted once again and assessed by the same assessment committee, unless special circumstances apply. | The advance reviewer may recommend that the candidate makes revisions to the manuscript. A candidate who insists on carrying out the dissertation cannot be prevented from doing so. | The assessment committee may recommend that the candidate make minor revisions to the thesis (within three months) before the committee submits its final report. |
| Opponents/ Grade Board for Public Defence | The opponent suggests the grading (pass, pass with distinction). The Doctoral Programme Committee of the School makes the decision of the assessment. | The grading committee is composed by at least 3, in special cases 5, members (a majority shall be external) | The assessment committee is composed of three members. At least two external (one of these must be a researcher from abroad). | Director of third-level education appoints opponent and members of the grading board. The opponent must be a prominent international researcher in the subject area. The board must be made up of either three or five members. The members should be docent and recruited from outside KTH. | The assessment committee is composed of three members. At least two external (one must be from institution abroad).  |
| Public examination | The school appoints one or two opponents for the public examination. The school decides the date and time of the public examination, the language used and the custos. The doctoral candidate defends the dissertation at public examination. After the examination, the opponent(s) has/have two weeks to submit a written opinion to the school on the dissertation and its defence.  | The thesis is defended orally in English or Swedish at a public defence at Chalmers campus. Information about time and place shall be distributed no later than three weeks prior to the defence.The thesis shall be available at Chalmers and equivalent institutions and at other colleges and universities in Sweden, three weeks prior to the defence.  | The defence takes place no later than three months after submission of the thesis. The main supervisor appoints an associated professor or professor at DTU to preside over the defence. | The defense must take place between 7 January - 15 June or 15 August -20 December. The respondent (=PhD student) (or opponent) presents the main results. After the opponent's review board members are invited to discuss with the respondent the questions that they consider need to be further elucidated. After that, others present has the opportunity to ask questions and / or comment on the thesis. | Before the public defence can take place, a trial lecture is held on an assigned topic. The Dean/person authorized by the Faculty chair the public defence. The candidate presents the main results. Two members of the assessment committee appointed by the Faculty serve as opponents during the defence.  |

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| Enforced Termination |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Enforced Termination | The right for doctoral study is permanent according to Finnish legislation. Disciplinary decisions of termination or temporary termination of the studies can be made. | If a doctoral student neglects his/her undertakings to a material extent or does not have the capacity to continue to a PhD according to the individual study plan, the head of department or deputy head of department shall decide that the doctoral student is no longer entitled to supervision and other resources for the doctoral programme.A specific guideline describes the process, how to appeal, and how the final decision is made. | When PhD studies are not proceeding satisfactorily, the student must be offered (only once) the opportunity to rectify the situation within three months. The student has a respite of reply. If the student declines the offer, enrolment will be cancelled. If accepting the offer, a new evaluation must be made, if this is still negative, enrolment is cancelled. The decision is final and cannot be protested. | *Disciplinary decision.* The student may for a fixed period not participate in activities that are related to studies at KTH.*Withdrawal of resources*. If a student substantially neglects the individual study plan, the student is no longer entitled to super­vision and other study resources.*Expulsion*. If a student suffers from mental disorder, abuse alcohol or drugs, or committed a serious crime, and there is substantial risk that the student may harm another person or valuable property during studies. | The Faculty may decide to enforce termination of PhD education prior to expiry of agreement period if one or more conditions are met: grave violations of obligations or ethical research guidelines, considerable delays in coursework or in the research project that make it reasonable to doubt that the candidate may complete the project on time.  |

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| Type of degree |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Joint degree | possible(two diplomas) | Not possible | Possible  | Possible | Possible |
| Double degree | possible(two diplomas) | Possible | Not possible (Only SDC - Sino Danish Center. A national agreement covering all Danish univeristies) | Possible | Possible |

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| Further information |
|  | **Aalto** | **Chalmers** | **DTU** | **KTH** | **NTNU** |
| Website | <http://www.aalto.fi/en/studies/admissions/postgraduate_studies/> | [Doctoral studies](http://www.chalmers.se/en/research/doctoral-programmes/Pages/default.aspx) | <http://www.dtu.dk/english/Education/phd> | <http://www.kth.se/en/studies/phd> |  [www.ntnu.edu/phd](http://www.ntnu.edu/phd) |
| Advertising of PhD-courses |  https://into.aalto.fi/display/endoctoralcourses/Homepage(no separate register for PhD courses) | Webb page: [Graduate courses](http://www.chalmers.se/en/research/doctoral-programmes/graduate-courses/Pages/department-graduate-courses.aspx) | Database on the internet<http://www.kurser.dtu.dk>  | NA | Database on the internet: <http://www.ntnu.edu/studies/phd/courses> |
| Guide for PhD studies | <https://into.aalto.fi/display/en/Homepage> | [Handbook for doctoral studies](https://www.chalmers.se/insidan/EN/education-research/doctoral-student/handbook-for-doctoral8636) | <http://www.dtu.dk/>English/education/Phd\_Education/PhD\_guide.aspx | Information to prospective PhD students <https://www.kth.se/en/studies/phd> Information to accepted PhD students is under way. | [Quality in PhD Education – Common Standard and Handbook](https://www.ntnu.edu/documents/1263185004/0/phd_haandbok_eng_web.pdf/5bb0beac-3554-4bad-a3e8-2d468121e905) |