



Doctoral Education at KTH

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KTH - Royal Institute of Technology



- **Kungliga Tekniska högskolan (KTH)**
 - Founded in 1827, leading technical university in Sweden
 - Approx 14000 Bachelor + Master level Students
 - Approx 2000 Doctoral students
 - 5000+ employees
 - 339 professors + 276 assoc/assistant professors
 - Five schools:
 - School of Architecture and the Built Environment
 - **School of Electrical Engineering and Computer Science**
 - School of Engineering Sciences in Chemistry, Biotechnology and Health
 - School of Engineering Sciences
 - School of Industrial Engineering and Management
 - KTH is ranked as the 74th university worldwide in the QS World University Rankings 2025.

EECS – School of Electrical Engineering and Computer Science



- 200 Faculty
- Approx 4400 students
- Approx 600 Doctoral students
- 4 Doctoral Programmes:
 - [Computer Science](#)
 - [Electrical Engineering](#)
 - [Information and Communication Technology](#)
 - [Mediated Communication](#)

Third-cycle education in Sweden



- Degree types:
 - **Licentiate** (2 years of full-time study)
 - **Doctor** (4 years of full-time study)
- PhD student positions:
 - **KTH Employed PhD student**: duration is 4-5 years depending on the teaching/departmental duties (cannot exceed 20%)
 - **Scholarship PhD student** (e.g., ERASMUS collaboration) duration is 4 years (100% activity, no dept. duties)
 - **Industrial PhD student** employed in industry, with minimum PhD activity of 50%.
- Doctoral studies are performed within a **doctoral programme**
- Doctoral student must have **at least two supervisors**, one is the main supervisor
 - The main supervisor can only be a docent or full professor
 - Doctoral student in Sweden has a right to request to change supervisor

Doctoral Degree Objectives in Sweden

For the Degree of Doctor the third-cycle student shall...

- **Knowledge and understanding**

- demonstrate **broad knowledge and systematic understanding of the research field** as well as advanced and up-to-date specialised knowledge in a limited area of this field, and
- demonstrate **familiarity with research methodology** in general and the **methods of the specific field of research** in particular.

- **Competence and skills**

- demonstrate the **capacity for scholarly analysis and synthesis** as well as to **review and assess new and complex phenomena**, issues and situations autonomously and critically
- demonstrate the **ability to identify and formulate issues with scholarly precision critically, autonomously and creatively**, and to plan and use appropriate methods to undertake research and other qualified tasks within predetermined time frames and to review and evaluate such work
- demonstrate **through a dissertation** the ability to make a **significant contribution to the formation of knowledge** through his or her own research
- demonstrate the ability in both national and international contexts to **present and discuss research** and research findings authoritatively in speech and writing and in dialogue with the academic community and society in general
- demonstrate the **ability to identify the need for further knowledge** and
- demonstrate the capacity to **contribute to social development and support the learning of others** both through research and education and in some other qualified professional capacity.

- **Judgement and approach**

- demonstrate intellectual autonomy and disciplinary rectitude as well as the ability to **make assessments of research ethics**, and
- demonstrate specialised insight into the **possibilities and limitations of research**, its **role in society** and the responsibility of the individual for how it is used.

- **KTH sustainability goal**

- Demonstrate the ability to **contribute to a sustainable societal development** toward a gender equal, inclusive and climate neutral society with knowledge and skills.



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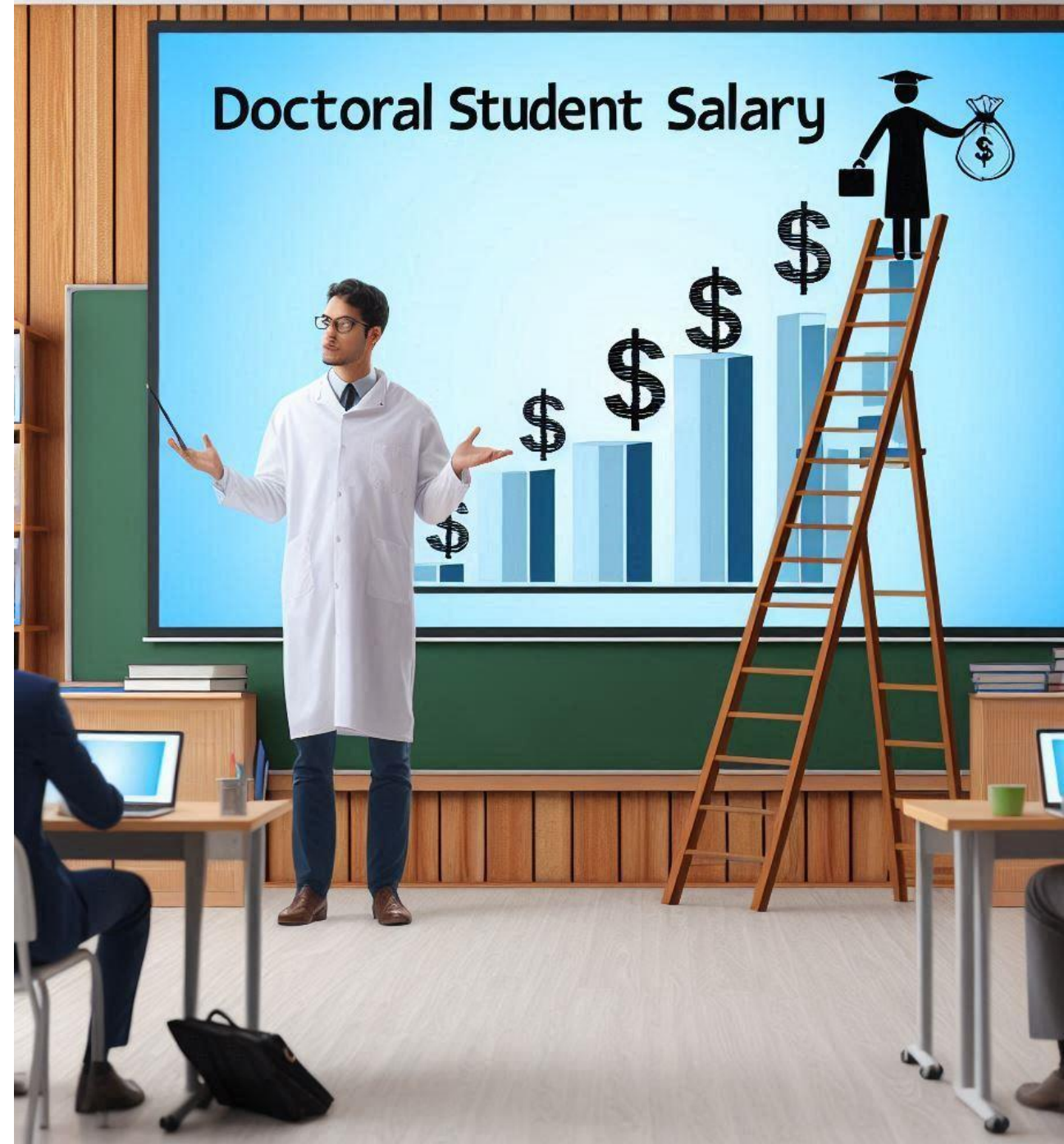
Individual Study Plan (ISP)

- Doctoral student must have an **Individual Study Plan (ISP)**
 - adopted after consultation with the doctoral student and his or her supervisors.
 - This plan shall **contain the undertakings** made by the doctoral student and the higher education institution **and a timetable** for the doctoral student's study programme.
 - Describes student's education, and what the student shall achieve **to meet doctoral degree objectives**
 - **Describes the research project** to be undertaken
 - **Describes what KTH shall provide** in terms of supervision, work place, etc
 - *The individual study plan shall be reviewed **regularly (annually)**.*
 - The most important **document** for formal assessment of progress and supervision support
 - A "contract" between the student and KTH.



PhD Progress and Salary Ladder

- Doctoral student salary
 - Basic salary (step 1): 32 000 sek (approx. 2800 EUR)
 - 30 % (step 2): 32 600 sek
 - 50 % (step 3): 35 000 sek
 - 80 % (step 4): 36 100 sek (approx. 3150 EUR)
- Structure of the doctoral degree:
 - Advancement to steps 2, 3 and 4 is done after **achieving the sub targets which are defined in the Individual Study Plan (ISP)** corresponding to 30 %, 50 % and 80 % of the total degree requirements of a doctoral diploma.
 - Can also be time-based, but rarely.
- Each student performs **30%/50%/80% Seminars**, showing that the sub-targets identified in the ISP were reached.
 - 50% and 80% seminars have an expert reviewer (not from supervisory team)
 - E.g., for 50% seminar, at least 30 credits of courses, and 2 publications



Course work

- Course requirements
 - **60 to 75 ECTS** depending on the PhD program/subject
 - Approx 1 year of effort.
 - Many **technical courses**
 - There is a possibility to take courses and MOOCs outside KTH
 - Summer schools can bring credits (but max 2 credits for a week)
- **Mandatory General skills courses (approx 10 ECTS)**
 - E.g., The Art of Doctoral Research
 - Introduction to Scientific Writing
 - Research Theory, Method, Practice
 - The Theory and Methodology of Science
 - The sustainable scientist
 - Basic Communication and Teaching



- More on General Skills courses: <https://intra.kth.se/en/eecs/forskarutbildning/courses/general-skills-courses-1.1137832>

Thesis at KTH

- Two forms of the thesis:
 - Monograph thesis
 - Compilation thesis
 - Kappa (the comprehensive summary in a compilation thesis) has to be written
- No requirement on a minimal number of papers, but usually at the EECS school, 5-6 papers from reputable venues is a norm.
 - For licentiate thesis (2-3 papers)



Before Defense

- Advance Reviewer (from KTH, docent or above)
- Thesis is printed (nailed) and can't be changed
- **Opponent**
 - Docent or above
- **PhD committee** (3 or 5 people)
 - Majority docents or above
 - Gender balanced
 - Majority from outside KTH
 - Stand-in member
- Conflict of Interest (Col)
 - No recent publications/projects with student/supervisors
 - Supervisor-student relationship is lifelong Col
- No reports, just discussion + vote

JORGE CHAM © 2012

YOUR THESIS COMMITTEE

Also known as: an impossibly difficult group to get together in one room but who nevertheless hold your future in their hands depending on their ability to reach a civilized consensus.



Your Professor

Simultaneously your biggest ally and your worst enemy. Will be the first to suggest you do more work.



The Guru

Only here for the free cookies. Don't forget to bring cookies.



**Adversary
The Adversary**

Has bitter rivalry with your Professor and will argue the exact opposite view. Work this to your advantage.



**The
Strawman/woman**

Nice guy. No opinions.



**The Assistant
Professor**

Still doesn't believe just a few months ago they were on the other side just like you. Pretends to be an adult.

NONE OF THEM WILL ACTUALLY READ YOUR ENTIRE THESIS.



- The doctoral thesis shall be presented and **defended orally in public**
- **Public part**
 - Student presentation (~45 min)
 - Discussion with the opponent (~1h)
 - Discussion with the grading committee (~1h)
- **Closed part**
 - Grading committee meeting
 - Supervisor can give a statement
 - Voting without supervisor/opponent present
 - Pass/Fail (unanimous/non-unanimous)
- **Public announcement**
- Post-defense questionnaire
- Fancy PhD Ceremony at the City Hall in November

Supervisory panels @EECS

- **Annual meetings** between a PhD student and two senior staff members who **are not their supervisors**.
 - The meetings are confidential
- The purpose of these meetings is to **discuss the progress of studies**, receive feedback and suggestions, **identify issues** requiring attention, and provide the PhD student with **valuable advice**, and **fresh perspectives** from senior staff members other than their usual supervisor.
- As a basis for the discussion, every student has to send their **latest ISPs** and to write up a **Student Declaration**
 - on their research project, taken courses, given seminars, overall progress, departmental duties, their view on supervision, suggestions how the studies can be improved etc.
- The **meetings are confidential**
 - After the meeting, one of the panel members informs doctoral program director that the meeting was held and if there were any issues to be addressed further (**if the doctoral student agrees**).





Annual EECS PhD student retreat

- **Lunch-to-lunch event** in Stockholm archipelago in June
- Three Parallel tracks
 - **“Increasing Academic Productivity and Managing Stress”**
 - techniques to help achieve academic goals, successfully complete research projects, and reduce the stress often associated with doctoral studies.
 - Based on the book "The Doctoral Student Handbook: Master Effectiveness, Reduce Stress, and Finish on Time"
 - **“Research Communication”**
 - Improving communication skills, allowing to discuss, explain, and summarize research project in different ways and for various audiences within diverse cultural contexts
 - **“Research Innovation”** (from next year).
- Keynotes by KTH alumni
- Social activities
- Good food



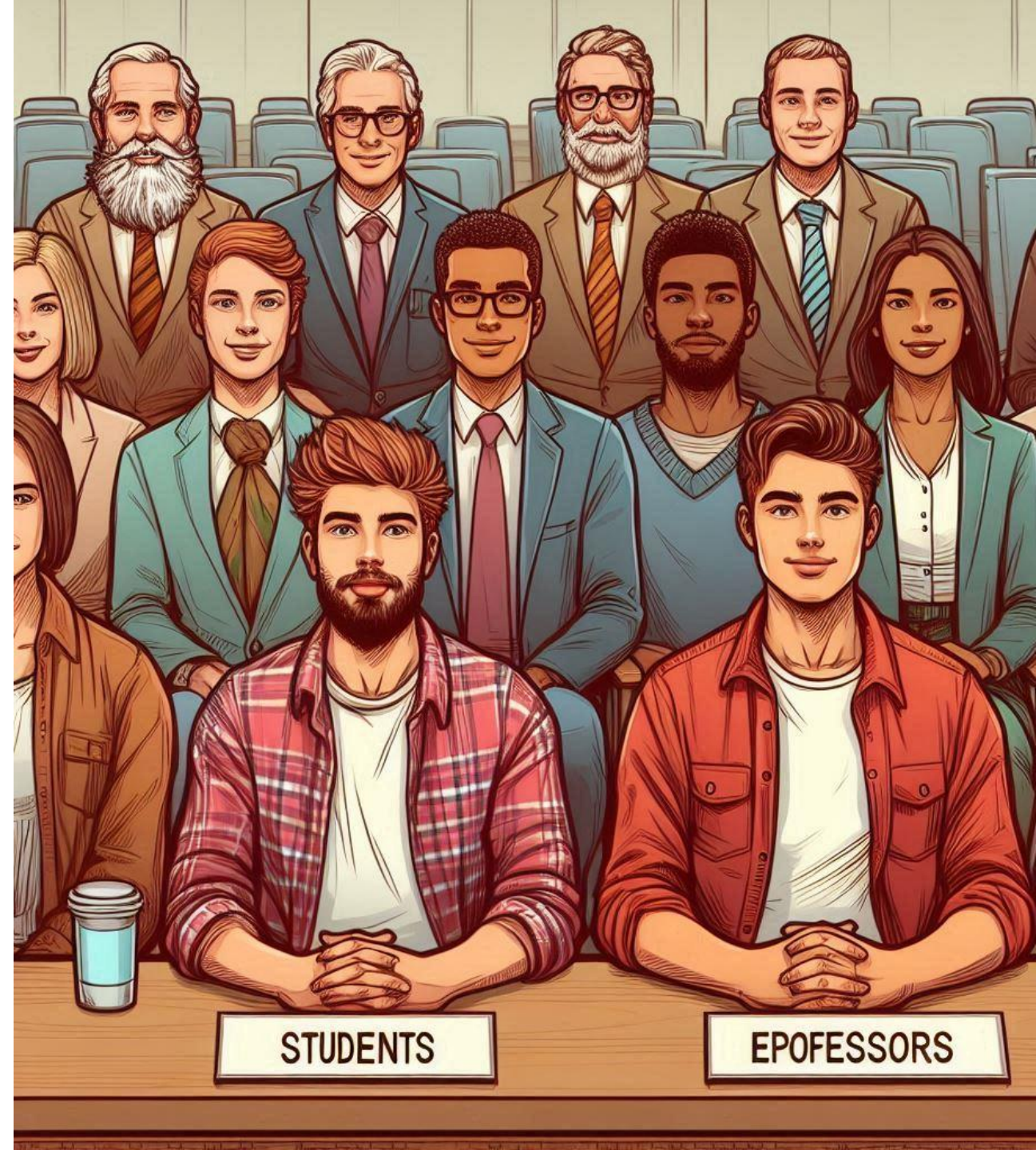
Work Environment

- KTH provides students:
 - Office Space
 - 2-4 people per room
 - In practice often single occupancy
 - Computer (laptop)
 - Other equipment when necessary
- Coffee + Free fruit in the kitchen
- Showers available for those who bike to work



Student influence

- The education and study environment at KTH is strongly influenced by the students, who are **represented on all boards and in all committees where decisions are made** about doctoral education.
- The student union, [THS](#), has a [PhD chapter](#) dedicated to continuous improvement of the quality of the doctoral education and working conditions for doctoral students.
- E.g., **Two student representatives** in the council for Thrid-Cycle Education at EECS (+7 professors)



Quality Management System at KTH

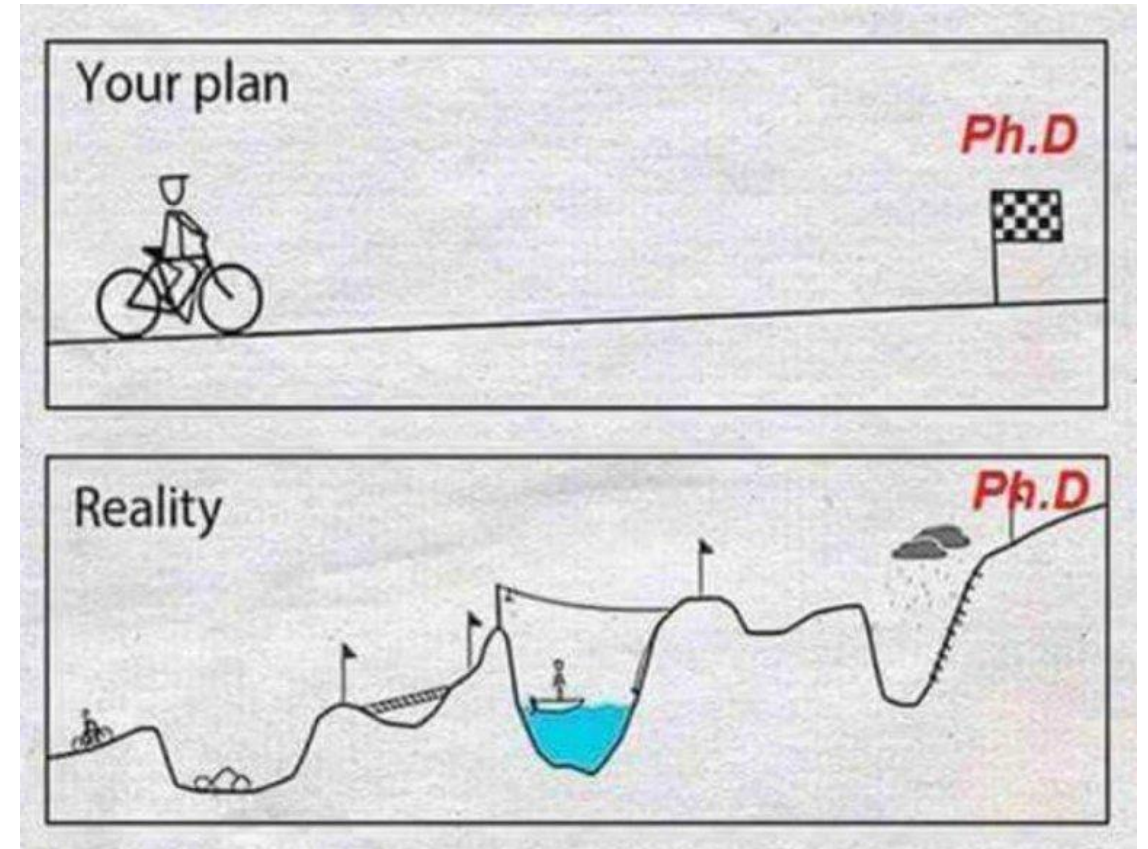
- **Annual Follow-up**
- **Bi-annual doctoral program reviews**
 - Areas of investigation:
 - Courses
 - Research Environment
 - Supervision
 - Education of supervisors
 - Goal achievement and progression
 - Thesis quality
 - Etc.
- **Discussions and feedback at the school and KTH level**
 - Students are involved

Monitoring tools

- Course analysis and evaluation
- Surveys of various kinds
 - Employee surveys by HR
 - Yearly PhD Council survey
 - Post-Graduation Survey
 - Surveys issued by PhD programs
- Feedback from Supervisory panels
- Data from ISP follow-up
 - Progression vs time spent
 - Progression seminars
 - Mandatory courses
- Number of problematic supervisor changes
- Post defense committee questionnaire

Advice to PhD students

- As PhD student, you are part of a research community, so take this opportunity and **build your own professional network**
- Reflect on your studies at least once a year (revise your ISP).
 - Align your expectations and those of your supervisor(s)
- You might feel alone, but **you are not alone**. If you need help, support, or advice, seek help when needed:
 - Main supervisor, Co-supervisor, Heads of Division and Department, Doctoral Education Support, Director of Doctoral Education, HR, Friends...
- **Enjoy the PhD experience**
 - PhD should be a great period of your professional and personal life.
 - Be prepared for ups and downs
 - Make friends and have fun!



From: adventuresinaphd.com

This is KTH

Sweden's no 1 technical university



Thank you!