KTH Royal Institute of Technology

Master's and PhD studies

Presented by:
Urban Westergren, professor
Department of Applied Physics
School of Engineering Sciences

Director China Relations

KTH web site   **Facts about KTH**   **Study at KTH**

KTH Royal Institute of Technology

One of the top technical universities in Europe

Short facts about KTH

- Established 1827 in Stockholm, Sweden

- People from more than one hundred nations

- Some numbers:
    - 13,500 full time students
    - 1,600 PhD students (with at least 50% activity)
    - 2,200 new students in master programs each year
    - 300 new PhD students each year
    - 600 members of faculty

Engineering and Science rankings

Comparison of QS rankings by subject 2024	KTH	ZJU
General rankings for 2024	73	44
Electrical & Electronic Engineering	23	51
Architecture & Built Environment	26	49
Mechanical Engineering	23	49
Materials Science	23	38
Civil and Structural Engineering	44	51-100
Computer Science and Information Systems	62	36
Mathematics	48	76
Chemical Engineering	58	36
Physics and Astronomy	64	87
Chemistry	87	37
Yellow shading: higher rank than KTH		
Red shading: lower rank than KTH		
KTH ranking in Times Higher Education 2023: 97		

The Kingdom of Sweden

- About 10 million inhabitants, ~2 million of whom live in the capital of Stockholm

- Has a pleasant climate thanks to the warm Gulf stream in the north Atlantic sea

- Combines a beautiful natural setting with modern technology and vibrant cities

- Home of the Nobel Prize, and many famous export companies, such as the examples on the next slide:

Sweden makes a lasting impression

Swedish entrepreneurship and ingenuity has helped shape the worlds of communication, furniture, fashion, music and much more. And no matter what the industry, there always seems to be that engineering approach.

Stockholm – a city of islands

Stockholm: a dynamic environment, modern, historic, clean air and water

Stockholm: an international city

- A multi-cultural European capital, communities from China, India and other countries

- A city with very clean air and water

- Quick access to city, campus and nature with excellent transportation: public, by bicycle or even by boat

- **Swedes speak good English**, very limited need to learn Swedish while studying in Stockholm
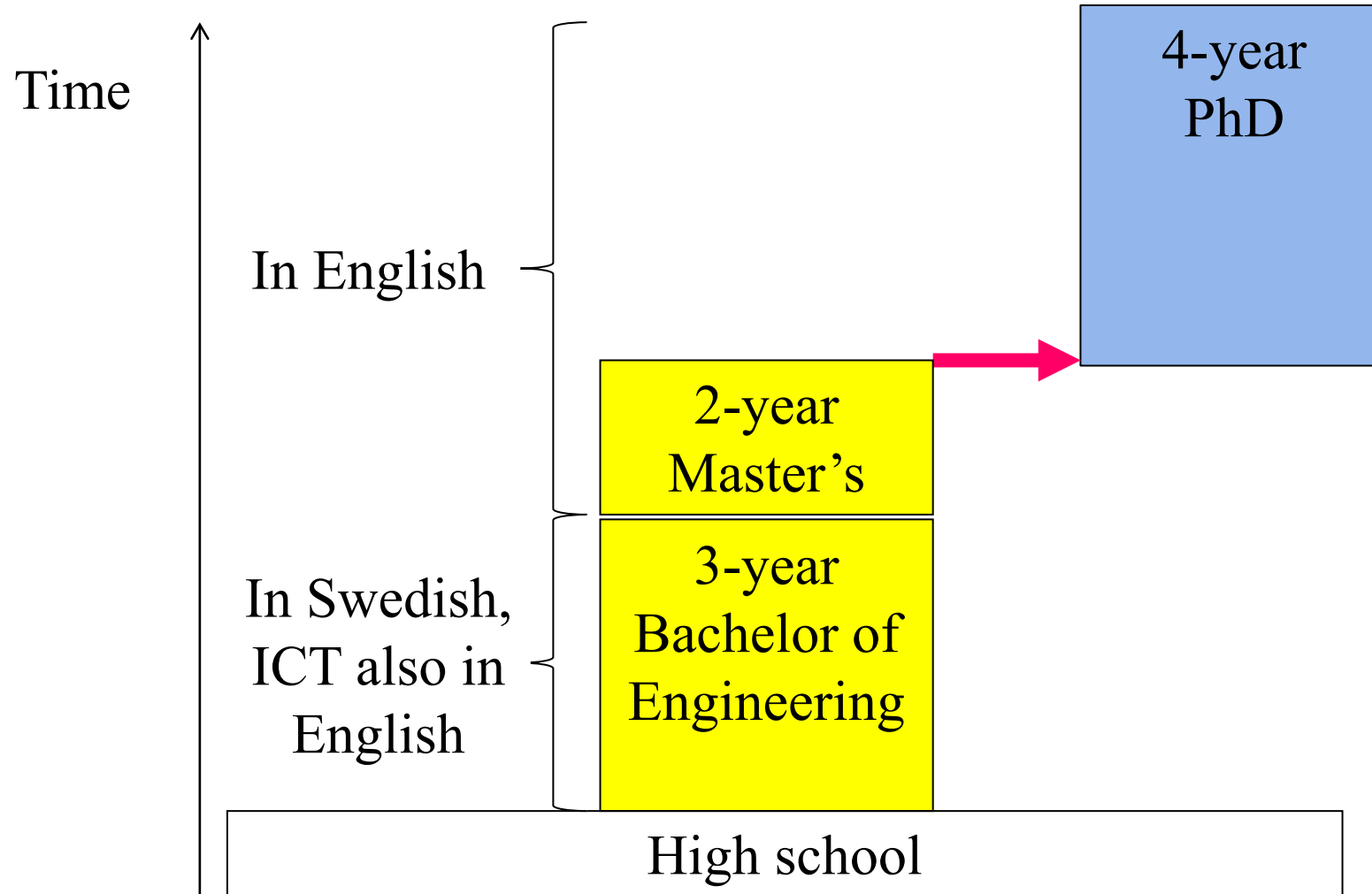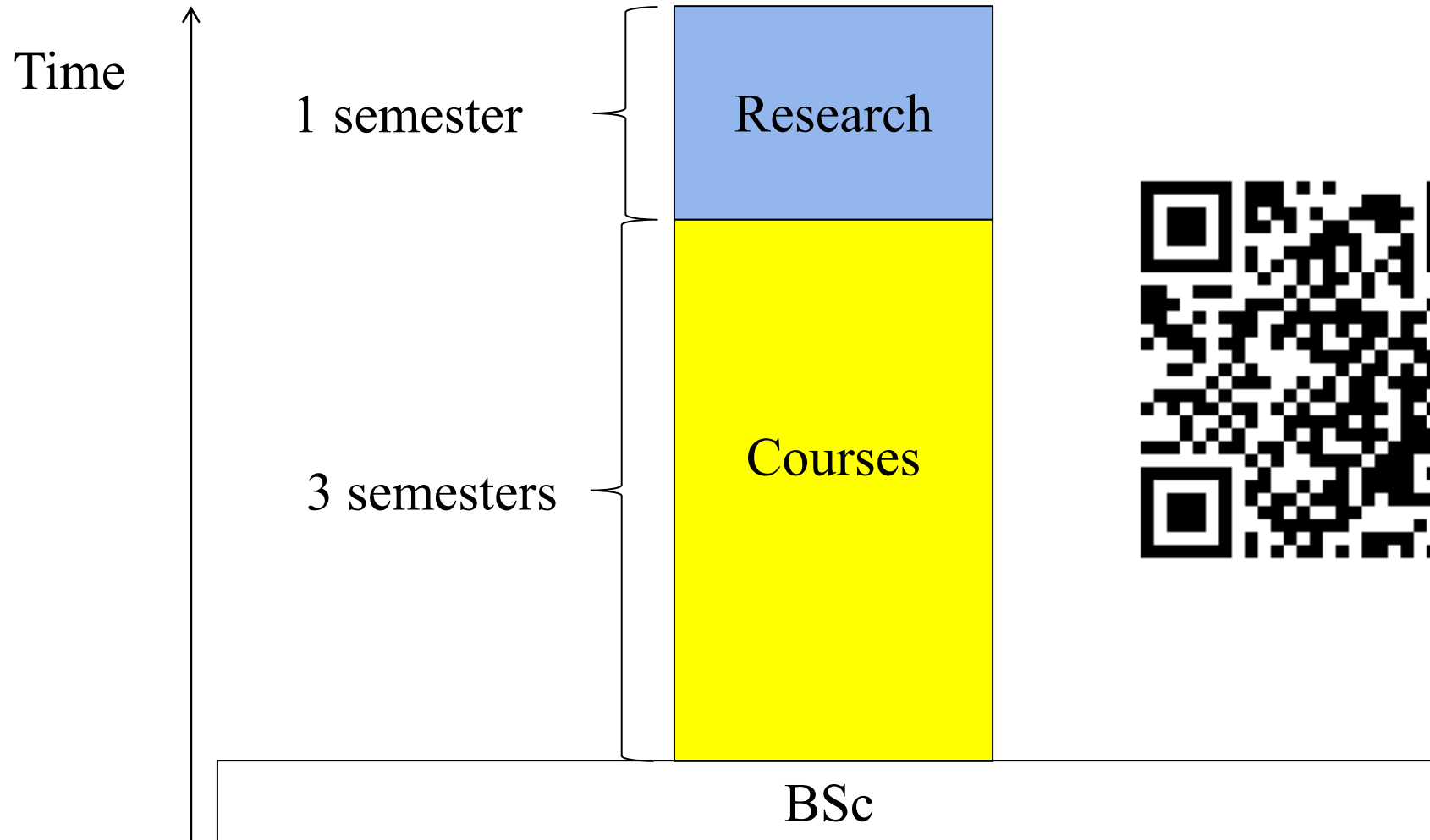
KTH main campus

Five campuses close to industry

Structure of education at KTH

Structure of MSc education at KTH

MSc programmes for entry in 2024

More than 60 programmes in several subject areas:

- Architecture and the Built Environment

- Computer Science

- Electrical Engineering

- Engineering Physics and Mathematics

- Energy and Sustainable Development

- Industrial Management and Innovation

- Information and Communication Technology

- Life Science Technology, Chemistry and Chemical Engineering

- Materials Science and Engineering

- Mechanical Engineering

Fees and Scholarships

There are application and tuition fees for non-EU/EEA/Swiss citizens for 1st and 2nd cycle studies (bachelor and master)

The tuition fee is SEK171k (about RMB114k*) for one year of full-time master's study, architecture 70% higher and bachelor 20% lower

Scholarships are available, for example:

- KTH Scholarship (covering the tuition fee), very competitive: 8% of applicants got offers in 2023

- Joint programs: Erasmus Mundus and EIT (European Institute of Innovation and Technology)

* Assuming exchange rate RMB 1.0 = SEK 1.5

Living in Sweden

When applying for a residence permit, you must prove to the Swedish Migration Board that you will have a guaranteed sum of money at your disposal throughout the entire period of your studies. The amount is SEK 9450*, about RMB 6300**, per month for ten months of the year.

Breakdown of budget per month, approximately:
- Food: RMB 1650
- Accommodation: RMB 3000 (for about 19 m^2)
- Local travel: RMB 500
- Phone/internet: RMB 350
- Other: RMB 800

* This sum was valid on 1 January 2023, subject to changes
** Assuming exchange rate RMB 1.0 = SEK 1.5

Joint MSc programs: two degrees from European universities

European Institute of Innovation and Technology (EIT)

- Combines education, research and business
- Master programs in ICT, energy and electrical systems
- Studies in two European countries
- Scholarships available

Erasmus+

- EU program at master and PhD levels
- Studies in (at least) two European countries
- Scholarships available

Nordic Five Tech

- Studies in two Nordic countries

Application requirements and process

- Completed Bachelor's degree is required except for 3+2 applicants, see following slides for terms

- English proficiency has to be shown (TOEFL 90 with writing 20, IELTS 6.5 with no subscore below 5.5 etc)

- There are programme-specific requirements (see www.kth.se/en/studies/master)

- Apply at www.universityadmissions.se

- Online application period: October 16 to January 15

- Results of admission distributed March 27

Application for KTH scholarship

- Applications for KTH scholarships are open from December 1, 2023, to January 15, 2024

- Applications are entered via the KTH web page:
  - Go to master studies: www.kth.se/en/studies/master/
  - Select "Scholarships" in the left menu and then "KTH scholarship"

- Scholarship opportunities: KTH Scholarship:

3+2 program

KTH MSc in 5 years from start of bachelor studies

KTH 2-year MSc

4-year bachelor

Admission to
KTH MSc
after 3 years
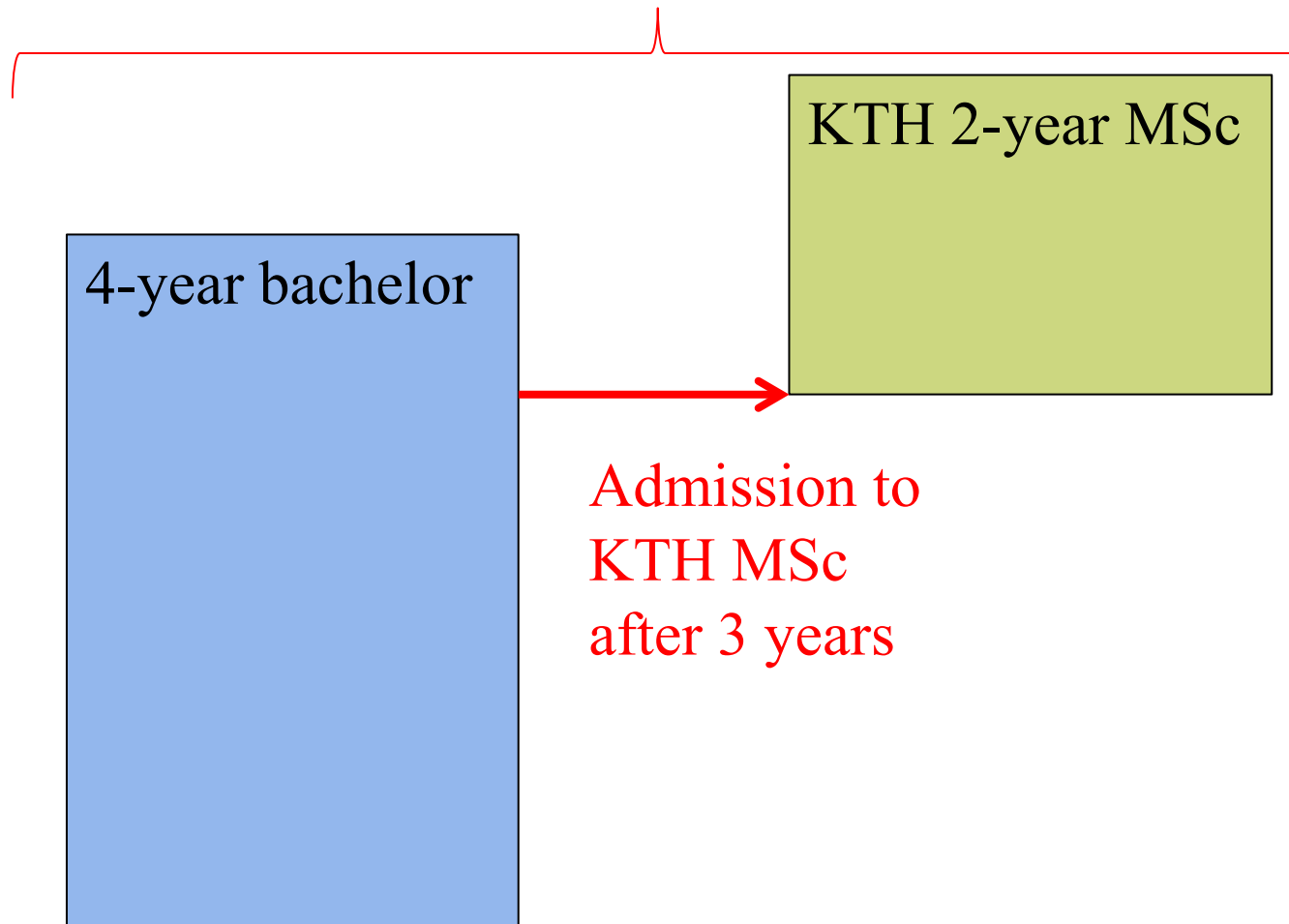
3+2 program

KTH and ZJU have a very successful 3+2 agreement since 2012

Students can apply during the 3rd year of 4-year bachelor studies. These applicants **must contact their home university administration**

Applications **should follow the mapping** agreed between bachelor majors and master programs. Applications outside of the mapping have a low likelihood of admission. **Joint programs and programs at other Swedish universities are NOT included in 3+2.**

Applications are made at universityadmissions.se , deadline January 15, 2024

3+2 applications

Include a table of this type in your application, including what courses you will take during the 6th semester, example for KTH master program in Engineering Physics:

KTH master program prerequisites, see "Entry requirements"	Corresponding bachelor level courses at your home university
Physics (including classical mechanics, thermodynamics, electromagnetism, waves, geometrical optics and quantum mechanics) equivalent to at least 45 ECTS	List courses and briefly describe contents
Mathematics (including differential and integral calculus, linear algebra, differential equations and transforms, and statistics) equivalent to at least 35 ECTS	List courses and briefly describe contents

60 ECTS credits is one full academic year of studies. At bachelor level, the credits from a Chinese university can usually be multiplied by 1,5 to get the corresponding number of ECTS credits, i.e. 1 credit at a Chinese university corresponds to approximately 1,5 ECTS credits

ECTS= European Credit Transfer System

3+2 applications

Example of a table suggested to be included when applying for KTH Computer Science:

KTH master program prerequisites, see "Entry requirements"	Corresponding bachelor level courses at your home university
Mathematics equivalent to at least 28,5 ECTS, there must be: 1. a course in one-variable calculus, 2. a course in linear algebra and 3. a course in probability theory and statistics 4. a course in discrete structures	List courses and briefly describe contents: 1. … 2. … 3. … 4. …
Computer Science/Information Technology equivalent to at least 22,5 ECTS, there must be 1. a course in object oriented programming, 2. a course in algorithms and data structures 3. a course in computational complexity	List courses and briefly describe contents: 1. … 2. … 3. …
A course in calculus in several variable is required for some of the tracks	Course and brief description

60 ECTS credits is one full academic year of studies. At bachelor level, the credits from a Chinese university can usually be multiplied by 1,5 to get the corresponding number of ECTS credits, i.e. 1 credit at a Chinese university corresponds to approximately 1,5 ECTS credits

ECTS= European Credit Transfer System

ZJU – KTH 3+2 mapping
Possible transitions

ZJU School of Biomedical Engineering and Instrument Science, major: Biomedical Engineering	KTH Medical Engineering
ZJU College of Biosystems Eng. & Food Science, major: Bioengineering	KTH Sustainable Technology KTH Industrial and Environmental Biotechnology KTH Medical Biotechnology
ZJU College of Chemical and Biological Engineering, major: Chemical Engineering and Technology	KTH Sustainable Technology KTH Chemical Engineering for Energy and Environment KTH Macromolecular Materials KTH Molecular Science and Engineering KTH Nanotechnology
ZJU College of Chemical and Biological Engineering, major: Pharmaceutical Engineering	KTH Sustainable Technology
ZJU College of Civil Engineering & Architecture, major: Civil Engineering	KTH Civil and Architectural Engineering KTH Real Estate and Construction Management (Students must have completed Engineering Economics, 2 credits; Engineering Project Management, 2 credits; Real Estate Economics and Evaluation, 2 credits; Civil Engineering Construction 3 credits or equivalent) KTH Environmental Engineering and Sustainable Infrastructure KTH Sustainable Technology KTH Transport and Geoinformation Technology KTH Engineering Mechanics

ZJU – KTH 3+2 mapping
Possible transitions

ZJU College of Computer Science & Technology, major: Computer Science and Technology	KTH Transport and Geoinformation Technology KTH Communication Systems KTH Computer Science KTH Embedded Systems KTH Interactive Media Technology
ZJU College of Control Science and Engineering, major: Automation	KTH Electric Power Engineering KTH Engineering Design (students only eligible for track Mechatronics) KTH Systems, Control and Robotics KTH Information and Network Engineering (students must have completed courses in Signals & Systems, Digital Signal Processing and Fundamentals of Programming)
ZJU College of Electrical Engineering, major: Automation	KTH Electromagnetics, Fusion and Space Engineering (Eligibility depending on student's course selection, see prerequisites of the master program at www.kth.se) KTH Electric Power Engineering KTH Embedded Systems
ZJU College of Electrical Engineering, major: Electrical Engineering and its Automation	KTH Embedded Systems
ZJU College of Electrical Engineering, major: Electronic Information Engineering	KTH Nanotechnology KTH Information and Network Engineering (students must have completed a course in Fundamentals of Programming) KTH Communication Systems KTH Embedded Systems

ZJU – KTH 3+2 mapping
Possible transitions

ZJU College of Energy Engineering, major: Energy and Environmental System Engineering	KTH Sustainable Technology KTH Electromagnetics, Fusion and Space Engineering (Eligibility depending on student's course selection) KTH Sustainable Energy Engineering
ZJU College of Energy Engineering, major: Mechanical Design, Manufacturing and Automation	KTH Sustainable Energy Engineering KTH Production Engineering and Management KTH Engineering Design KTH Integrated Product Design KTH Vehicle Engineering KTH Engineering Mechanics (Students only eligible for track Fluid Mechanics)
ZJU College of Energy Engineering, major: Renewable Energy Science and Engineering	KTH Sustainable Technology KTH Electromagnetics, Fusion and Space Engineering (Eligibility depending on student's course selection) KTH Sustainable Energy Engineering
ZJU College of Energy Engineering, major Vehicle Engineering	KTH Production Engineering and Management KTH Engineering Design KTH Integrated Product Design (students ony eligble to track: Innovation Management and Product Development-IPDE) KTH Engineering Mechanics

ZJU – KTH 3+2 mapping
Possible transitions

ZJU College of Information Science and Electronic Engineering, major: Electronic Science and Technology	KTH Communication Systems KTH Electric Power Engineering KTH Embedded Systems KTH Information and Network Engineering KTH Engineering Mechanics
ZJU College of Information Science and Electronic Engineering, major: Information Engineering	KTH Information and Network Engineering KTH Communication Systems KTH Embedded Systems
ZJU College of Information Science and Electronic Engineering, major: Microelectronic Science and Engineering	KTH Embedded Systems/Inbyggda system (Students only eligble to tracks Embedded Platform/Embedded Electronics & SoC Design) KTH Nanotechnology
ZJU School of Material Science and Engineering, major: Material Science and Engineering	KTH Nanotechnology KTH Engineering Materials Science
ZJU College of Mechanical Engineering, major: Industrial Engineering	KTH Engineering Design KTH Production Engineering and Management

ZJU – KTH 3+2 mapping
Possible transitions

ZJU College of Mechanical Engineering, major: Mechatronics Engineering	KTH Engineering Design (Students only eligible for track Mechatronics) KTH Integrated Product Design (Students only eligible to track: Innovation Management and Product Development-IPDE) KTH Production Engineering and Management KTH Embedded Systems
ZJU Ocean College, major: Marine Science	KTH Sustainable Technology
ZJU Ocean College, major: Ocean Engineering and Technology	KTH Sustainable Technology
ZJU College of Optical Science and Engineering, major: Opto-Electronics Information Science and Engineering	KTH Engineering Physics (Students eligible if elective courses in Electromagnetic Field & Waves and Quantum Optics: Fundaments and Applications have been taken at ZJU) KTH Nanotechnology
ZJU Department of Polymer Science and Engineering, major: Macromolecular Materials and Engineering	KTH Sustainable Technology KTH Macromolecular Materials KTH Nanotechnology

Comments on the 3+2 applications

General comments

Most 3+2 applicants will see the status "unqualified" in universityadmissions.se during the admissions process: Ignore this! It usually only means that your transcripts indicate that you will not have a bachelor degree before entering KTH. If your name is on the list KTH has received, KTH will mark your 3+2 application so that it is processed anyway.

Instead check carefully that you have uploaded all documents that are compulsory for each master program for which you are applying before February 1.

Do not wait until January 31 to start uploading documents! Something may go wrong and then your application is considered LATE and is only evaluated if there is time left at the end of the evaluations. That is unusual since each master program may receive more than 1000 applications.

Comments on the 3+2 applications

Acceptance rates, numbers available on the KTH website

Most popular master programs 2023 (≤10%):
- ICT Innovation: <8% for 4 of 6 tracks
- Cybersecurity: 8%
- Computer Science: 8%
- Systems, Control and Robotics: 9%
- Machine Learning: 10%

Average acceptance rate for all master programs: 32%

Easier programs to be admitted to (≥50%):
- Sports Technology: 73%
- Technology, Work and Health: 71%
- Chemical Engineering for Energy and Environment: 59%
- Medical Biotechnology: 57%
- Macromolecular Materials: 52%

Languages: English or Swedish?

- **Good knowledge of English is fundamental** for successful education at KTH
- Sweden has a local language but there is **very limited need to learn Swedish** when studying since people in Sweden speak good English
- All KTH students who do not have Swedish as their first language are invited to an introductory course in Swedish language and culture. The course is free of charge for all students
- **Good advice: focus on English in the beginning!**

Career prospects after a KTH degree

- Statistics for master's programmes:

  - 50% had a job even before graduation

  - >90% had a job within 6 months of graduation

  - >30% became PhD students

PhD studies

- Three years of full-time research, one year of courses
- Engages around 2,000 people
- A large proportion international PhD students
- A candidate has to apply for a position
- All PhD student positions are announced on the KTH web site:

https://www.kth.se/en/studies/phd

- Employment with a salary if admitted, but competition for positions

Things you can do after finishing education at KTH...

- Employed at IT company in Sweden

- KTH master program in Communication Systems, KTH-HUST 3+2 Program, KTH Scholarship holder, 2018-2020

- Bachelor: HUST, Telecommunications Engineering, ranked #1 of 200 students

# Things you can do after finishing education at KTH…

- Ph.D. student at the Division of Decision and Control Systems, KTH, since July 2018
- M.Sc. degree in Embedded systems from KTH in 2018
- B.E. degree in Control Science and Engineering from the Honors School, Harbin Institute of Technology (Harbin, China), 2017

Things you can do after finishing education at KTH...

- PhD in Electronic and Computer Engineering, Hong Kong University of Science and Technology, expected degree in 2023
- Master of Science in Systems, Control and Robotics, KTH, 2019 (KTH-UM-SJTU-JI 3+2)
- Exchange Student, ETH Zurich, 2019
- Bachelor of Science in Electrical and Computer Engineering, University of Michigan-Shanghai Jiao Tong University Joint Institute, 2018

Things you can do after finishing education at KTH...
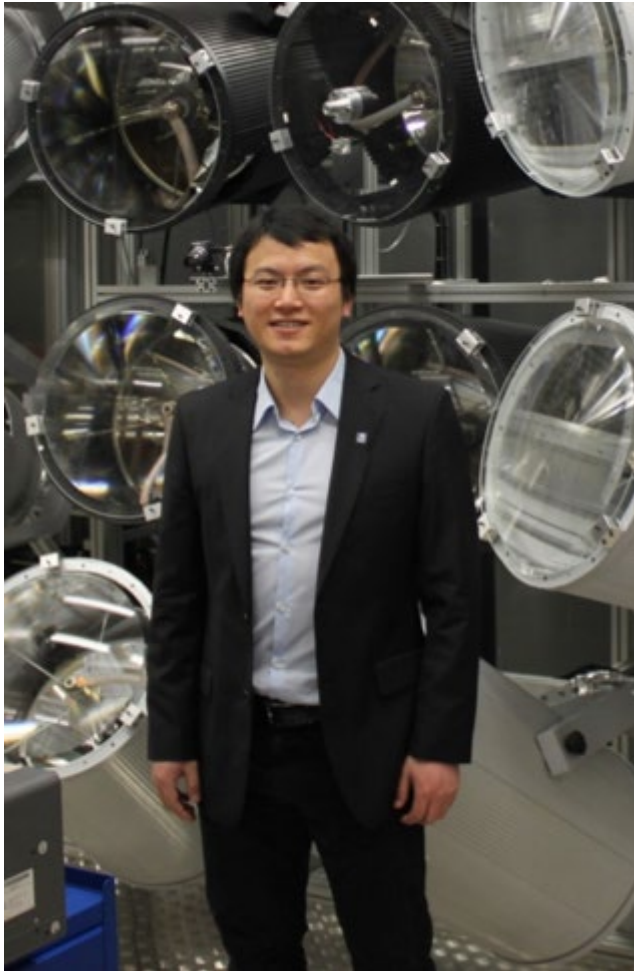
Permanent researcher, KTH.
Consultant at the company EPS AB.

- Researcher at Energy Technology Department. KTH, Sweden, 2018-2020.

- Postdoctor at Energy Technology Department. KTH, Sweden, 2016-2018.

- PhD in Concentrating Solar Power. KTH, Sweden, 2015.

- MSc in Engineering Thermophysics. Zhejiang University, China, 2010

Things you can do after finishing education at KTH... go into space!

Professor Christer Fuglesang
Professor in Space Physics, KTH

- Mission crew STS-116 & STS-128 Shuttle Discovery, NASA-ESA 2006 & 2009
- Astronaut at European Space Agency 1992-present

- PhD in Experimental Particle Physics Stockholm University, 1986
- Master in Engineering Physics KTH, 1981

Things you can do after research at KTH… collect the Nobel prize!

Professor Hannes Alfvén

- Nobel Prize in Physics, 1970 for Magnetohydrodynamics

- Professor in Electrical Engineering University of California, 1967-1991

- Professor in Electromagnetic Theory and Electrical Measurements KTH, 1940-1991

- PhD in Electromagnetic Waves Uppsala University, 1934

Nobel Prize ceremony in Stockholm on December 10 every year
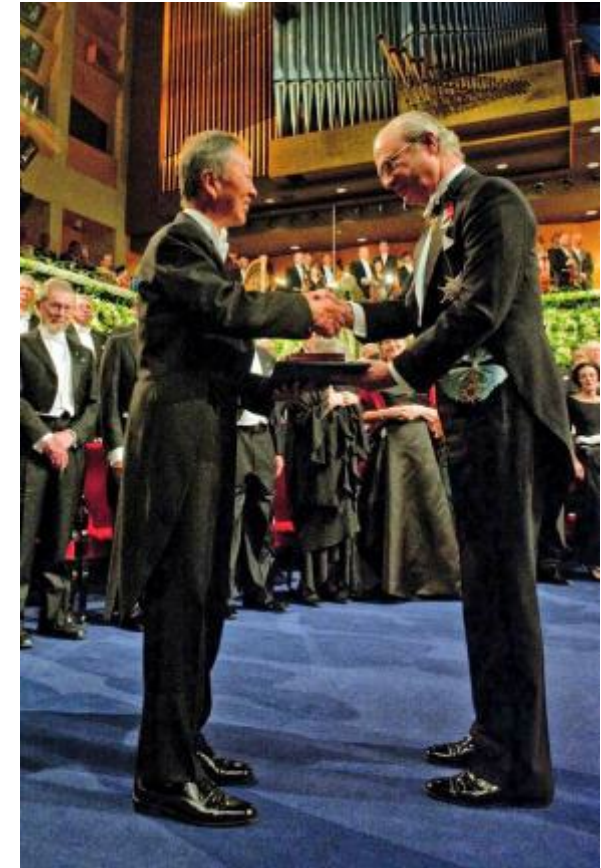
... may take a few years after graduation...

The Nobel Banquett

International students from KTH attended the Nobel Banquett in, the Stockholm City Hall, dressed in traditional costumes.

Welcome to KTH: launch your career!

Videos about KTH

https://space.bilibili.com/12838896/video

https://www.bilibili.com/video/BV1C5411j78Y?spm_id_from=333.999.0.0