



# Master's Studies 2014 / 2015

Innovate Yourself at KTH





## Prof. Peter Gudmundson

*President, KTH Royal Institute of Technology*

“Welcome to KTH, an illustrious university with a history of talented researchers and academics, state-of-the-art facilities and pioneering ideas dating back to 1827. All of these elements continue to contribute to advancements here, and more importantly, to positively impacting industry and society as a whole. Our extensive international student body and partner universities ensure that Master’s students will find an inspiring and creative environment at KTH – one with a global perspective that is committed to helping them explore the potential of their chosen field. I’m proud to be part of such an outstanding institution.”

*Peter Gudmundson*

ΚΤΗ Royal Institute of Technology has served as one of Europe's key centres of innovation and intellectual talent for almost two hundred years. Recognized as Sweden's most prestigious technical university, ΚΤΗ is also the country's oldest and largest. With over 18,000 students and an international reputation for excellence, the university continues to nurture the world's brightest minds, helping to

# Master's Studies

## Architecture and Civil Engineering

The field of Architecture is concerned with the engineering, design and analysis of buildings, while Civil Engineering is devoted to techniques for designing, constructing and maintaining roads, railway tracks, bridges and tunnels. Both areas depend on the successful integration of the latest technology with the goal of societal improvement.

## Electrical Engineering

Electrical Engineering is a discipline that has had a huge impact on the technologies that define modern-day life and society. ΚΤΗ has a strong reputation for innovative research in this field and offers students the opportunity for study and research in a wide variety of subjects, including wireless systems, electric power engineering, smart networks, integrated circuits, embedded systems, systems engineering, space physics, fusion, and networked services.

## Energy and Sustainable Development

Both Energy and Sustainable Development are of increasing global importance, and ΚΤΗ is a leader in these burgeoning fields. Programme focus can range from nuclear and environmental engineering, sustainable technology, energy innovation, to those involving the field of Life Science Technology.

## Engineering Physics and Mathematics

Engineering Physics involves a profound knowledge and understanding of physics, as well as experience with analytical and computational tools. Mathematics furthers knowledge of mathematical concepts and methods that are fundamental to many technical and scientific subjects. Both areas allow the student to customize their selections depending on individual career objectives.

## Industrial Management and Innovation

This is a collection of programmes for those who wish to take leadership positions in industrial and technology based organizations. Courses can focus on management, entrepreneurship and the economics of growth – from the industry, functional and individual levels – to management and engineering of energy and environment.

---

## Master's Degree Overview

ΚΤΗ offers Master's students nine fields of study and fifty degree programmes within those fields to choose from. Master's degrees last for two years, are taught in English and prospective students must have a completed Bachelor's degree for admission. ΚΤΗ is an advocate of an interdisciplinary approach to education – encouraging students to incorporate other platforms and areas, if necessary, to help achieve their degree aims. Lectures and studies typically last for one and a half years, with six months devoted to writing a degree project. With ΚΤΗ's emphasis on applied knowledge, many Master's students will have the

opportunity to collaborate with industry leaders throughout the duration of their degree. The university also provides many unique Master's programmes, like the Dual Master's for instance, which allows students to earn a concurrent second degree at a partner university. Erasmus Mundus, EIT Master and the Nordic Master also offer opportunities for prospective students. The application for regular Master's programmes starting in 2014 is open from mid October 2013 until mid January 2014.

Information and Communi-



## General information

### Admission Requirements

A completed Bachelor's degree, corresponding to a Swedish Bachelor's degree (180 ECTS), or equivalent academic qualifications from an internationally recognised university is required for admission to a Master's programme at KTH. In addition, programmes may have specific entry requirements that must be met – a Bachelor's degree in Science or Engineering is required for most programmes.

Prospective Master's students must also provide proof of English proficiency equivalent to TOEFL 575 (90 for Internet-based test) or IELTS 6.5. Note that admission requirements and procedures are subject to change; please check the relevant requirements online before submitting an application: [KTH](#) [UHR](#)

### Application Procedure and Deadlines

All KTH Master's programmes have one entry per year and the autumn semester starts in late August. The application for the 2014 entry will open mid October 2013 and close mid January 2014. The application is web-based and coordinated by the Swedish Council for Higher Education (UHR) on the following website: [UHR](#)

Please note that the admission requirements, fees, application procedures and deadlines for the Erasmus Mundus and EIT programmes differ from the application process for the regular Master's programmes.







“The big challenges we currently face on the planet – from climate change, resource scarcity and the need for affordable, sustainable energy require a much broader spectrum of learning and skills than were previously necessary,” says Professor Semida Silveira, Head of Energy and Climate Studies at ΚΤΗ. “We are in a unique and strong position at ΚΤΗ to offer Master’s students a well-rounded understanding of the many integrated levels in this complex field.” Energy technology and sustainable

# Energy and Sustainable Development

Awareness of the world's finite resources and the urgency with which science and technology are being employed to tackle the problems of climate change and energy use, have given rise to a new era of academic focus – Energy and Sustainable Development. KTH approaches this broad and critical area by encouraging a cross-platform selection of programme studies.

Master's students have the option to customize their degree, choosing courses from a variety of fields: energy, biotechnology, architecture, ICT and many more. There are also unique Master's programmes available, like those offered by the Euro-

## BECCS – a case study

KTH has many examples of graduates applying their knowledge to successful business models, with tremendous global implications. One such example involves new ways to effectively implement Carbon Capture and Storage (CCS) – helping to find solutions for climate change. Biorecro is a company started by two KTH graduates, Henrik Karlsson and Lennart Byström, with the aim to make the current CCS prototype commercially viable for industries.

By using Bio Energy Carbon Capture Storage

(BECCSgr33(31)53.7(r)s pg(1ffi1.1 p016-)672(5)1 E526b8tr.19ga3.7(r)s5.(7)10.71(t)672(5)1 M8(2(a)u3.6((rn)5)do.717t)6



## Graham Aid

*Researcher R&D for Ragn-Sells AB, Sweden,  
PhD candidate in Industrial Ecology*

I come from the u.s. and have the unlikely background of first obtaining a BSBA degree in international business. I found that the studies only revolved around promoting profit, with very limited social or economic responsibility. I then researched which countries have a strong reputation for environmental science, energy research and sustainable development

and Sweden was at the top of the list. KTH has been a fantastic environment, helping me to develop my academic focus and has led to an interesting and successful career.

I did my degree project and was offered a job right away, with Ragn-Sells AB – the largest environmental services provider in Sweden. My focus is in the entrepreneurial development division of the company; we work to create new recycling and biofuel applications in conjunction with major industries. My interests are thermo-chemical techniques,

design for recycling and industrial symbiosis. KTH really emphasizes a ‘hands-on’ approach to knowledge – applying what is learnt in the classroom and labs. So, when you find yourself in a career relating to your field, the transition is easier than most universities would offer. Also, industrial recruiters are right here on campus, often working with the students as they develop their research and ideas. You don’t have to look very hard to find work after your KTH degree.



## Balachander Chokkalingam

*Master's Student in System,  
Control and Robotics*

The focus of my Master's degree involved interdisciplinary programmes in Electrical Engineering and Computer Science – specifically Systems, Control and Robotics. With my coursework now completed, I am finishing my degree project by working at Tobii – leaders in the new area of eye-tracking computer technology. I came to know about Tobii from career fairs held at KTH

and I think that the skills I have gained in the last year and a half have definitely contributed to my degree project; being a KTH student enabled me to get involved in the Tobii project in the first place.

The projects, assignments and labs at KTH are very well designed. I have always felt comfortable learning a subject by actively applying the knowledge. The courses are well taught and we have our exams scheduled twice or three times a year, so there is practically no exam stress – with learning being the main motive.

My course was also very flexible, where we could choose what we wanted to do; we could tailor make our Master's degree.

Both education at KTH and life in Stockholm has put me on the right track. I am now more confident to collaborate internationally and having a KTH Master's degree has already created many opportunities. Coming to KTH has been a very good decision for me – I have enjoyed meeting people from all over the world, had fun in their company and have learnt a lot from them.

# Life Science Technologies

KTH understands the importance of breaking down barriers in both education and research, encouraging academic focus to involve an interdisciplinary selection of programmes. Life Science Technology adheres to this approach and promises Master's students a rich and varied educational experience – one that will benefit their personal career goals.

Life Science Technology is a platform encompassing a multitude of areas: medical and biomedical technology, computational biology, chemical engineering and molecular science, among others. All courses under this umbrella aim to achieve the

goal of producing valuable work between the interconnected areas of technology, natural science and medicine. KTH also has the advantage of many ongoing partnerships, as with the Karolinska Institutet, helping to provide some of the most important medical advances in the world. This is a crucial field for the future of health care and how we as humans are better able to tackle diagnosis, disease treatment and quality of life. KTH offers a uniquely diverse course selection to accommodate an individual's area of interest, forming a collective basket from which Master's students can choose how they wish to develop and grow – the only limits of scope are determined by the students themselves.

All courses under this umbrella aim to achieve the goal of producing valuable work between the interconnected areas of technology, natural science and medicine.

## Future Career Opportunities

Life Science Technology programmes at KTH are diverse but intrinsically linked, providing students with the university's close connections to industry and further research work, on a global scale. Large pharmaceutical companies now increasingly turn to universities like KTH for new innovations, with the number of smaller biotech companies in Sweden having tripled in the last ten years. The need for new, creative medical technologies is one facet of a broad spectrum of career applications available to Life Science Technology students. This field, among many others devoted to human health, will continue to grow in importance as an aging and expanding population creates the challenge of supplying better treatment, technologies and health care for the future.

## Tobii – a case study

An exciting, successful example of a cross-pollination of ideas is in the groundbreaking technology of Tobii. Can you imagine controlling your computer using only your eye movements – eliminating both keyboard and mouse controls? Tobii have developed a pioneering automatic eye tracking technology that is already revolutionizing several key industries: disability aids, industrial and medical applications and has huge potential in the gaming

business. Started in 2001 by former KTH students John Elvesjö and Mårten Skogö, the company has doubled its turnover every year since its inception, and now includes almost 200 employees and offices in the U.S., Japan, Germany, Norway and China. Tobii has won a myriad of design and innovation awards and now counts a further seven former KTH students amongst the ranks of this globally recognized company.

# Information and Communication Technology

KTH has an internationally acclaimed reputation in the area of ICT, leading in research, education and ingenuity. Master's programmes are available in English and cover the entire spectrum of the field, focusing on nanoelectronics, photonics, electronics, computer systems, software technology, communication and cognitive sciences. With excellent, modern facilities available for both lessons and research applications, KTH has roughly 2,000 full-time students currently enrolled in ICT programmes, with 45 professors and 30 associate professors specializing in the field.

KTH research in ICT is notably strong and it is ranked among the best in the world, with the

university securing high marks from international experts for its breadth of focus and consistent quality. Research is spread across five strategic platforms – Energy, ICT, Materials, Life Science Technology and Transport – and funding comes from a myriad of sources including the European Union, Swedish Research Council and private companies, making KTH one of the most competitive in Europe for securing funding. The ICT campus in Kista is surrounded by one of the world's largest ICT clusters, providing Master's students the unique opportunity to apply their knowledge in the heart of the industry.

**KTH research in ICT is notably strong and it is ranked among the best in the world, with the university securing high marks from international experts for its breadth of focus and consistent quality.**

## iPack – a case study

In 2007, KTH developed iPack – an ambitious research programme begun with the aim to revolutionize product packaging. By combining traditional materials with cutting-edge sensors, iPack innovations have enabled the tracking and security of products during shipping. This previously uncharted territory has blossomed into a successful ICT centre, with renowned international professors now involved in research and development. The impact

of iPack innovations will benefit many industries. For example, iPack can help the food industry in Europe eliminate €10 billion worth of waste a year, from the ineffective transportation and storage of food; iPack offers a solution by attaching an ingenious transmitter with the food, wirelessly sending data regarding its location and status – a brilliant innovation, benefiting both businesses and the environment. Watch a film of the iPack case study at:  

## Future Career Opportunities

KTH has many ICT industry ties, ensuring that Master's students can successfully move from the world of academia into a successful career. KTH Kista is located just outside of central Stockholm and is surrounded by roughly 1,400 companies, including global brands like Ericsson, Microsoft, IBM, Intel and many more. Here you will find the headquarters for most of the leading ICT businesses in Europe, with Kista ranked among the top five in the world for innovations in telecommunications. Master's students will benefit greatly from this proximity to international leaders in ICT, and they in turn, look to KTH to supply the talent and ideas for the future.



## Qin Zhou,

*PhD student, Information and Communication Technology (ICT)*

I feel proud of my PhD studies here in the iPack Center and it is quite inspiring to work with so many distinguished professors, senior researchers and other talented PhD/Master's students. We are devoted to developing ultra-low power wireless communication systems and innovative printed electronic systems – which are

cutting-edge research projects aiming towards the future.

KTH is a very international university and it provides an extremely open and inclusive study environment. As a student at KTH, we often have opportunities to attend industry-academia joint seminars and participate in joint research projects, filling the gap between universities and industries. This eases students into the job market. As a female PhD student in the ICT area, I especially feel that equality and gender balance

is strongly advocated here in Sweden, no matter which school or industry.

My PhD studies at KTH have created a solid foundation for my future profession. The university provides a holistic and interactive education, giving students the ability to independently think and innovate. We learn not only how to solve a problem but also how to find a problem. These skills have been a great help in improving my presentation and communication skills, and enlarging my professional network.

# Stockholm: A Beautiful, Cutting-Edge Capital

As a KTH Master's student living in Stockholm, you will be part of one of the most dynamic and enterprising cities in Europe. Routinely ranked in the top ten in the Global Innovation Index, Sweden and its capital are recognized around the world as an important creative and technical hub, and a fantastic place to put your learning into practice. As is the case with KTH's philosophy regarding education, Stockholm encourages the best and brightest ideas to develop and flourish.

International technology magazine, Wired, recently featured Stockholm as one of the "hottest" startup cities in Europe, beating both Paris and Berlin as a key investment centre for global venture capitalists. The list of pioneers in this cutting-edge world is growing every month – from exciting new advances in telecommunications and revolutionary apps, to valuable market research tools and soon-to-be universal e-commerce payment models. The pool of talent and innovative ideas in Stockholm seem inexhaustible; the city is a place bursting with ingenuity, entrepreneurial spirit and an industry infrastructure helping individuals to fully realize their potential.

Besides being a leading light in the world of high technology, Stockholm and KTH are also a breeding ground for engineering talent that global leaders like Scania and ABB are reliant upon, employing many graduates every year from the university. These companies are continually working closely with KTH to ensure that students are able to

secure excellent jobs in their chosen field, and they in turn, are able to continue their successes.

Beyond academia, Stockholm also offers KTH students a beautiful, culturally diverse environment, fusing many of the best aspects of Europe into a safe and clean capital; the population are adept at speaking English and Stockholm is considered one of the world's most livable cities. This last acknowledgement may have something to do with the blend of Stockholm's stunning natural surroundings and a bustling, modern centre. Composed of seven islands, and hundreds more in the archipelago, Stockholm's inhabitants are understandably very appreciative of their natural environment and take full advantage of its diversity – utilizing the clean air, proximity to water and unspoiled woodlands in every season. And for those desiring a more cosmopolitan, urban experience, there are unlimited activities for KTH students to enjoy in the city, with a myriad of cafes, art galleries, theatres and restaurants offering endless options for free time outside of studies.

From being the home of the Nobel Prize, to its continuous contributions in the world of technology and engineering, groundbreaking research and new, cutting-edge ideas, Stockholm and KTH afford Master's students an unparalleled environment to pursue their higher education – in one of Europe's most formidable universities, and cherished capital cities.

**Routinely ranked in the top ten in the Global Innovation Index, Sweden and its capital are recognized around the world as an important creative and technical hub, and a fantastic place to put your learning into practice.**





The campus at Kista Science City is surrounded by hundreds of the world's leading technical businesses



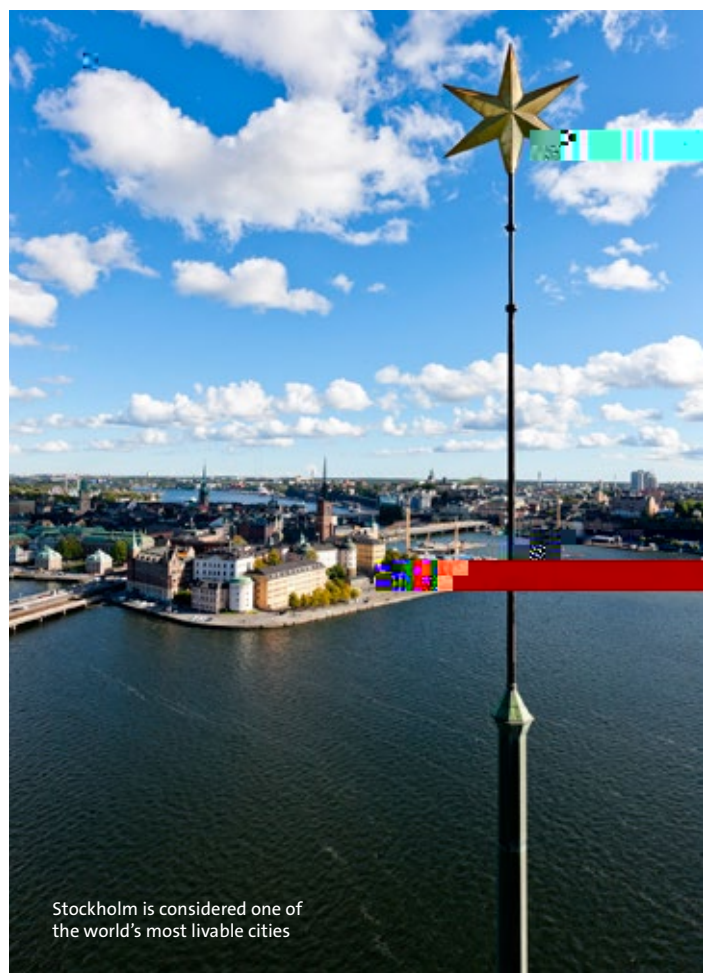
Escape for a day to one of the many beautiful islands in the archipelago



Graduates of KTH accept their diplomas in Stockholm City Hall, where the Nobel Prize is awarded every year



It's always easy to enjoy the fresh air around the city



Stockholm is considered one of the world's most livable cities

Originally coming from the Jilin province in north-east China, Bingcheng has settled into Stockholm and her Master's programme with relative ease, enjoying the international flavour and benefits of living in one of Europe's most revered capitals. "Some of the best things for me about Stockholm are the most obvious – the beautiful, clean environment and the city's facilities are excellent. I could hardly see the blue sky where I come from! I also really like the general feeling of Swedish culture and the people. They're educated, open and very friendly."

When asked if it was a difficult cultural transition coming from China to Stockholm, Bingcheng is enthusiastic about how helpful KTH were regarding the move. "The University were extremely helpful in answering questions and offering support services when I arrived. The biggest adjustment came

# KTH and Stockholm: What's it like?

## How was your arrival at KTH? Was it difficult getting settled in?

"The first week at KTH was perhaps the moment when I realized that studying here was the best decision I could have made. The Master's introduction programme is a great way to discover Stockholm and its beauty, and become oriented in the services and places the university has to offer. Those friends that I met during that time are still my best friends here in Stockholm! For this reason I suggest to every new Master's student to take part in the introduction week in order not to miss this opportunity."



## Was KTH a good choice for you, academically and culturally?

"I feel very happy about choosing KTH for my studies. The KTH 'tag' itself marks its own identity all over the world, which is one of the best things about being a student here. And the experience of interacting, studying and living with other students from every corner of the world is one of the best that you will ever have in your life."



## Can you briefly describe some of your experiences of KTH life?

"I grew up in a very small village, so for me KTH has been an exceptional experience academically, and also because of the city – you can find everything in Stockholm and all the activities are close to you. Another thing I really like is the campus life at KTH, it does not matter what you are interested in, there is something for everyone."



## What are some of your favourite things about Stockholm?

"I love walking through Stockholm, which is an old city, the closeness to water is lovely and there are so many beautiful buildings – there are always things happening like theater shows, concerts, art fairs etc. And Sweden has four proper seasons; there are things to enjoy all year. A fantastic place."

## Has Stockholm lived up to your initial expectations?

"Absolutely, the city is just amazing! I doubt that you can find such a beautiful city with such a magnificent landscape, and beautiful people in any other part of the world. You can walk from a club and in 10 minutes you will be at the beach or in the middle of a forest. It is also a very international city. When you walk in Stockholm, you can hear different languages all the time, and you meet people from every corner of the world which means you will never get bored."

